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Contractors and Engineers Monthly

Vol. 46, No. 10 OCTOBER, 1949 $3 a Year, 50 Cents a Copy

Covering the Field

Personnel Training

Missouri compares maintenance methods for its employees by means of a color movie. See page 61.

The New York Department of Public Works has launched an in-service training course for its people. Details on this page.

Snow Removal

A flexible snow-fighting organization, up-to-date equipment, and streamlined highway design ease the winter-time strain in Wyoming, as page 2 explains.

Building Construction

Electric jacks boost slip-form efficiency on a grain-elevator job—see page 5.

Procedures in the pre-cast tilt-up method of wall-panel construction are outlined on page 41.

Flood-Control Work

A little town with a big name, Punxsutawney, has less to fear from rain and run-off now that the creek through town has been widened and deepened. See page 12.

Highway Department Safety

Not only Motorist John Doe but the men who build and maintain highways are guarded against accidents in Connecticut. Page 17 tells how it's done, and how the program is paying for itself.

New Bridge Deck

Page 25 tells of a general repair job on an old Missouri River bridge—in particular, of deck reconstruction with portland-cement concrete slabs.

Harbor Dredging

Two dredges—Los Angeles and Beaver—have moved 3,900,000 cubic yards of material from Mugu Laguna, Calif., under a $1,439,000 contract. See page 31.

Concrete Paving, Truck Lane

A special red lane for slow-moving vehicles was included in the 10½-mile concrete-paving contract described on page 36.

Dams for Power

How three power companies joined forces to build two dams on the highly developed Wisconsin River is told, page 45.

Bituminous Paving

Reconstruction of a popular road in Maine called for a 3-inch surface course of bituminous macadam on a 1-inch leveling course. Story on page 50.

Sewer for Airport

The sewer job reported on page 55 is the first step in a large-scale expansion at Miami International Airport.

Meetings Here and There

What the roadside-development engineers of Division I had to say at their annual meeting is summarized on page 58.

The New England Highway Exposition is recorded in pictures and text on page 84.

Grading and Overpasses

Three overpasses and a lot of gravel fill in swampland marked construction of a 5-mile section of belt line to encircle the Greater Boston area. Page 63.

You will find "In This Issue" on page 4)

C. & E. M. Photo

A Koehring 34-E Twinbatch paver chutes concrete into a narrow feathering-out section of a red-tinted truck lane on U. S. 241 near Fayetteville, Tenn. Wright Contracting Co. of Columbus, Ga., held the paving contract described on page 36.

This is a general view of Petenwell Dam on the Wisconsin River, as seen in early stages of construction from the top of the mixing plant. The scaffolding supports Pumpcrete and dewatering lines. Three power companies are building the dam (see page 45).

C. & E. M. Photo

For its contract to build some new reinforced-concrete grain-storage tanks and a new head house for the Salina Terminal Elevator Co. in Salina, Kans., the Jack Construction Co. developed special slip forms with electric control for the jacks. See page 5.

In-Service Training Launched in New York

Program Includes Five Sessions Held in Main and District Offices For Department Employees: Content Of Course Is Selective, Specific

✦ AN effective in-service training program was conducted for all employees of the New York State Department of Public Works during the winter and spring of 1948-49. Designed to acquaint them with the Department's far-flung activities as well as with details of their own particular jobs, the entire program was prepared and delivered by key men in the organization. In general, each specific topic was discussed by top-ranking administrative officials or by heads of bureaus or units with functions pertaining to the topic.

The course was presented in five parts or sessions, with one scheduled for each month from December to April. Each session was designed to take one full day for presentation. Starting off with a meeting in Albany for main-office and District 1 personnel, the contingent of lecturers would then move on to the remaining nine district offices to repeat the same schedule for the benefit of employees stationed there.

Five Sessions

The first session was repeated on two consecutive days at each of the ten districts for the benefit of all employees, half of whom attended at a time so the offices would continue to function. Subjects covered at the first session included: a general introduction, explanation of departmental regulations, the safety program, public relations, and utilization of punch-card business machines.

The second session was more specific in content and required but one day at each district. Only supervisory personnel attended the first two discussions which covered organization and reports. During the afternoon session they were joined by the clerical staffs for three lectures on contracts, business methods, and supervision.

The third session was held for engineering personnel only and occupied one full day. Subjects covered were: the building program, canal program, right-of-way problems, soil mechanics, and specification writing.

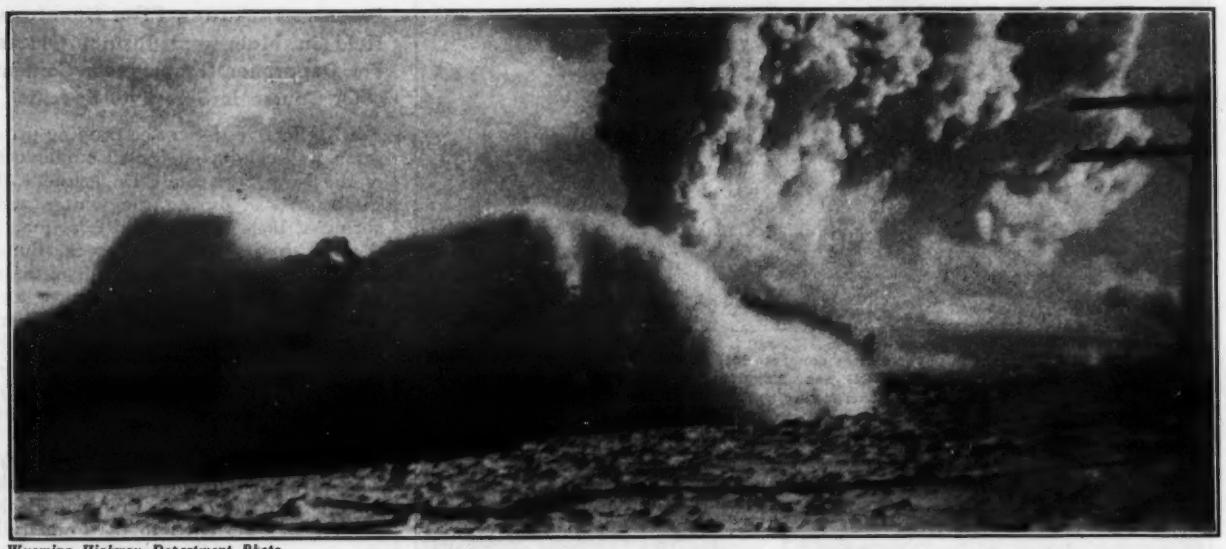
Following the day on which session 3 was held in Albany for engineering personnel, a session of architectural design criteria was held for all technical employees in the Albany office of the State Architect. The same course was conducted next day in New York City for architects in that office of the Department.

The fourth session was also technical in nature, requiring one day in each district. Subjects covered were: the highway program, highway standards, Thruway standards, urban arterial highways, and safety.

Again, the day following session 4

(Concluded on page 88)

Out in lonely range country near Encampment, Wyo., a Caterpillar No. 12 motor grader clears a road of snow. The 73 state maintenance motor graders are all on call for snow-removal work during the winter.



Wyoming Highway Department Photo

Here a V-plow breaks through a drift on the C. B. & Q. railroad. Wyoming uses 29 large Wausau truck-mounted V-plows with wings.

Wyoming Highway Department Photo

Wyoming's heaviest artillery against snow is the rotary. Here a Snogo, one of 12 owned by the state, goes into action.

Snow Fighters Are Public Nursemaids

People Demand Increased Service from Busy Crews Who Have Snow Removal On Their Minds, Too

✦ LATE last winter, after one of the worst Wyoming snowstorms in a decade, a newspaper reporter asked J. R. Bromley, Superintendent of the Wyoming Highway Department, "What did this snow teach you?"

"Nothing," shot back the plain-spoken boss of the Highway Department. "We already knew snow was hell before this storm blew in."

As the crestfallen reporter went away with little to report, Bromley added under his breath, "It didn't teach the public anything, either. People still insist on taking chances."

Bromley was never so right, and nobody knows it better than W. E. Sutton, Maintenance and Equipment Engineer. Last winter Sutton's men pulled people out of snowdrifts, intercepted them as they tried to get out afoot and freeze to death in the sub-zero weather, fed them hot coffee, and tried to talk some sense in their heads.

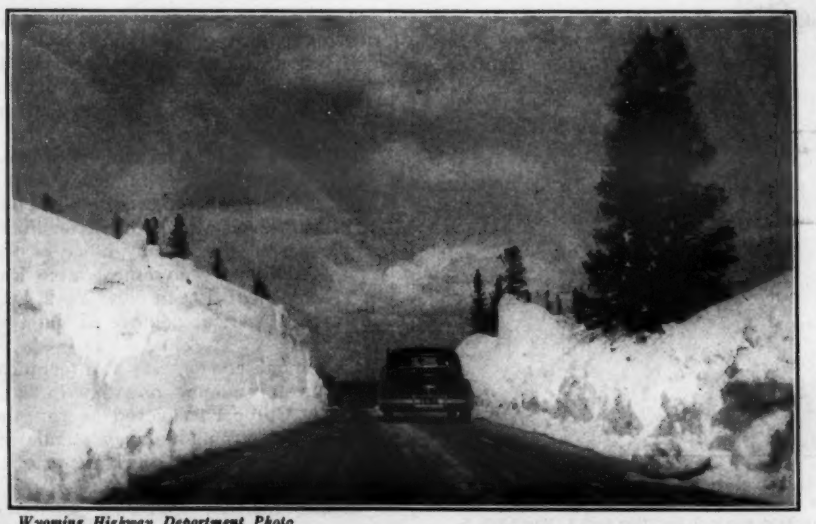
In appreciation of these good deeds, the public responded nobly. It took chances on highways covered by the longest continuous blizzard on record, despite the efforts of highway patrolmen to turn people back. Skiers parked their cars where they were sure to interfere with snow plows. When the worst storm in years blocked highways, airports, and railroads, it was the Highway Department that caught hell from John Q.

Continuing its "appreciation" throughout the summer, to really pay the Highway Department for a job well done, the public vandalized emergency line shacks, broke the windows, stole some of the stoves which weren't anchored in concrete, shot holes with a high-powered rifle into a motor grader, and snipped pieces out of the high-pressure hydraulic tubing. Doubtless this was all in the spirit of good clean fun. At least that's the way the Highway Department looked at it, because to the snow fighters, it's part of a day's work, and after all, the public pays the bill.

A Well Equipped State

As a matter of fact, Wyoming is one of the best-equipped states in the nation, when it comes to snow work. Snow and bitter weather are a part of Wyoming, from the first of November until the first of May. For a good many years the engineers worked hard to prepare for snow. They got better and better

(*Continued on next page*)



Wyoming Highway Department Photo

Deep drifts piled up over this road through Snowy Range, but a Snogo cleaned a path.

Wyoming Highway Department Photo

Even in mid-April the work isn't over—bad slides like this one cause much grief.

equipment, and as it became obsolete they traded it in for newer stuff. No Air Corps general was ever more interested in a plane of the future than Wyoming's highway engineers are when a new piece of snow-removal equipment appears on the market.

While the equipment engineers were busy modernizing that end of the job, Wyoming's design engineers went to work to visualize a highway—even in mountainous country—which would shed its own snow load. How well they succeeded in the past 10 years can now be told by saying that the maintenance men would rather fight snow accompanied by wind.

"When the wind blows, we've got work to do on about 20 per cent of the highway," Sutton explained. "If it snows when the air is still, you've got the whole highway system to clean up."

The streamlined design now appearing in other states is an accepted fact in Wyoming. Here a perfect combination of highway design and good snow-removal equipment is operating in such a way that 4,250 out of 4,500 miles of local, state, and Bureau of Public Roads highways are maintained for traffic the year round. A few passes, largely through parks and summer vacation spots, are allowed to snow in. But Teton, Twogotee, Buffalo-Ten Sleep, and South Pass are now maintained through the winter.

Wyoming's year-round highway system carries U. S. 30 at the top, for Highway 30 carries interstate trucks and all kinds of transcontinental travel. Other highways on the east-west route are U. S. 20 and U. S. 16. Several north-south highways are also maintained.

U. S. 30 is such a reputable highway, in fact, that many people are now starting to use it even in winter. The maintenance men of Wyoming, Nebraska, Utah, and Idaho have kept the route so clean that for ten years traffic moved with never a tie-up. Last winter all hell broke loose in the form of the worst continuous spell of blizzards which many old-timers can remember. In the howling gales the snow quickly piled up behind snow fences, and in the 20 per cent vulnerable portion of the highway system, it piled drifts up to 15 feet high and over a mile long.

While all this was at its height, Doug Stewart, Superintendent of Maintenance down in Colorado, was busy also, because the storm extended down to the high Rockies at Denver. Both State Highway Departments knew the condition of the roads, and gave it almost eagerly to all who called. But somehow a Denver radio station got misleading information, and succeeded in routing much traffic north to Cheyenne, Rawlins, snowdrifts, blocked highways, headaches, and cusswords.

It can be considered a highly significant yardstick in the measure of the Wyoming Highway Department to note that in all cases of severe blizzards, the roads were either maintained continuously or opened in a matter of a few hours after the snow and winds died down.

A Flexible Organization

The snow-fighting organization is set up through seven district maintenance foremen at Rock Springs, Sheridan, Lander, Casper, Newcastle, Cheyenne, and Basin. Each of these maintenance foremen is responsible for approximately 650 miles of highway, more or less, depending on the mountains, passes, grades, traffic count, and the general nature of the country.

The control center for this maintenance group is in the State Capitol Building at Cheyenne, where Sutton's office is located. In a bad storm, where out-of-the-ordinary troubles crop up, Sutton maintains long telephone and radio vigils, and his organization is so flexible that he can and does send equipment wherever it is needed, regardless of the normal district to which it is assigned.

The equipment was purchased with the needs of the state as a whole in mind, rather than districts. While the normal administration of snow removal is through the several maintenance engineers, each man knows that when a blizzard throws at him more than he can take, help will soon arrive.

"We've got good operators, who will go anywhere in a crisis on a minute's notice," Sutton said. "That helps, because good operators are still scarce in Wyoming and the men stay with their machines when circumstances make a temporary transfer necessary."

The main snow-removal fleet is built up around 150 small one-way speed plows, most of them Wausaus, mounted on the same 1½ to 3-ton trucks which double during the summer season to haul asphalt and gravel on routine maintenance. Snow-removal thinking is also centered around fast push-plow operation. It has a number of advantages. The small plows can do 90 per cent of the work if they get on the job and work fast enough. Thus the faster they get on the job, the more nearly normal traffic can be maintained.

It would be foolish to depend entirely on push plows, because the 10 per cent of snow they can't get is the sum and substance of the public's bellyache. This

(*Continued on page 69*)

Wyoming Highway Department Photo

Snow can pile drifts up to 15 feet high in Wyoming, but streamlined highway design has corrected about 80 per cent of the places where this was apt to occur.

Constructing Texaco Asphaltic Concrete paving on the First Street "tie-in" with U. S. Route 290.

Same type of pavement being laid on the Seventh Street "tie-in" with U. S. 290.

Helping Texas solve Austin's traffic problem

As a result of linking First and Seventh Streets with U. S. Route 290, traffic entering Austin from the east has been expedited considerably. General contractor was McKown & Sons of Austin. Asphalt contractor was J. M. Dellinger, Inc., of Corpus Christi.

Completed Texaco Asphaltic Concrete pavement on Seventh Street. Traffic averages approximately 10,000 vehicles a day.

The Texas State Highway Department has long-range plans for eliminating traffic congestion at Austin, the state capital. The $725,000 project pictured here is part of this over-all plan. It is designed to speed the flow of traffic entering or by-passing Austin from the east.

Here is another important state highway project, in which the pavement is resilient, heavy-duty Texaco Asphaltic Concrete. Thanks to its rugged, shock-absorbing, joint-free qualities, Texaco Asphaltic Concrete is delivering long service with low upkeep on many of America's most heavily traveled streets and highways.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils are refined from selected crudes. They provide the road builder with products to match every need—heavy-duty paving, low-cost surfacing or maintenance. For complete information on all types of asphalt construction, write for our booklets, "Road Building with Texaco Asphalt by the Pressure Distributor Method" and "Texaco Asphalt Paving—Plant-mixed Types."

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Edgar J. Buttenheim, President
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Bribery in Equipment Buying

In a midwest county, a highway commissioner is charged with accepting a $300 bribe from an equipment-distributor salesman in the purchase of a motor grader. The county commissioner approached the salesman and demanded that sum in order to "swing the deal". The salesman complied, and then informed the authorities. The commissioner subsequently pleaded guilty to the charge and is awaiting punishment.

This is only one of several such instances coming to light throughout the country, involving equipment-distributor salesmen and officials of county highway departments. From the number of indictments that are being handed down by grand juries, all such "deals" apparently cannot be kept in the dark. But how many such transactions are escaping public notice?

Both equipment distributors and county authorities have a duty to the public in such matters and from sundry reports gleaned here and there about the country, some state highway departments also need to be reminded of a like obligation. Equipment and material salesmen who do not report bribery overtures by public officials to their company heads should be dismissed on the spot. And if such salesmen are the instigators of these dishonest schemes, the contacted official should waste no time in airing the details, and starting procedures against the culprit. If the bribe can be traced back to the distributing company itself, then the affair is even a greater crime, and the concern should be punished accordingly. Dealer associations must also act quickly and courageously to protect the rest of their group.

Unfortunately, the dishonest public official will always be with us to some extent, either active or waiting his chance when he thinks he may get away with something. No one knows where or when he will maneuver to further his own dishonest interests at the expense of the public. Everlasting vigilance, and the courage to expose such venality, are the chief weapons the public must exercise to bring these evildoers to justice.

Asphalt Spex Should Be Amended

The life of an asphalt highway may be shortened ten years or more by overheating the mixture during construction.

That is the considered opinion of one of the top bituminous engineers of a highway department in the west. What he says makes good sense. The cause is not a secret, and a number of papers on the subject have been presented before the Asphalt Paving Technologists, but this engineer suggests a cure not found in some current highway specifications.

For quite a few years, engineers have wondered why asphalt highways sometimes become brittle and crack without apparent reason. Airports have been observed whose asphaltic pavements sometimes expanded and contracted exactly like more rigid-type pavements. Why?

This bituminous engineer says it is because the asphaltic cement was artificially aged in field hot plants. While by no means as prevalent a cause of failure as poor subgrades, deliberate overheating of asphalts and aggregates is taking years of valuable service life from many roads.

To prove the point, this engineer has made a rather complete set of extraction tests on asphalts after they have passed through the hot plants at temperatures in accordance with specifications. He found that high temperatures very greatly influenced the ductility and "life" of the asphalt after it was placed in the pavement.

He cited one case of a 200-penetration asphaltic cement which was *reduced to a penetration of 30* by 375-degree heat in accordance with the specifications for that job.

The cure suggested seems simple and as safe as common sense can make it. Instead of specifying the heat latitude in degrees of temperature, which leaves the resident engineer and plant operator little leeway, why not have specifications which read something like this: "The asphaltic cement and aggregates shall be heated to the *lowest* practicable temperature at which complete coverage of the mineral particles can be obtained. In no case shall the mineral aggregates be overheated. Asphaltic cement shall be maintained in large bulk and not agitated appreciably."

If this kind of specification were integrated with a really cooperative liaison between the resident and research engineer, we believe it would probably add years of life to high-type asphaltic highways.

Survey for Toll Road Is Authorized in Mass.

The appointment of a five-man commission to direct a $150,000 survey of a proposed toll highway across the state of Massachusetts was recently approved by the State Legislature. The road, if undertaken, would extend from Sturbridge, on the Connecticut border, to the New Hampshire line; its cost is estimated at $70,000,000.

Commissioner of Public Work William F. Callahan will be one of the members.

ARBA-AASHO Committee

A cooperating committee for joint study of matters of mutual interest has been appointed by the American Road Builders' Association and the American Association of State Highway Officials. With increased efficiency in the highway industry and profession as its objective, the joint committee is expected to initiate a series of meetings and study projects at an early date.

Colonel E. R. Needles, ARBA President, has named the following men to the ARBA committee: H. G. Sours, consulting engineer of Columbus, Ohio, Chairman; Alan Buck, Macon County Superintendent of Highways, Decatur, Ill., and President of the ARBA County Highway Officials' Division; J. D. Bonness, Milwaukee, Wis., contractor and Vice President of the ARBA Highway Contractors' Division; A. B. Gay, Richmond, Va., contractor; J. R. Steelman, Vice President, Koehring Co., Milwaukee, Wis.; and H. H. Kranz, City Engineer of Cincinnati, Ohio, President of the ARBA Municipal Division.

Members of the AASHO committee, as announced by C. W. Brown, the organization's President, are: C. M. Hathaway, Ill., Chairman; G. T. McCoy, Calif.; J. A. Anderson, Va.; G. A. Hill, Conn.; E. L. Roettiger, Wis.; and A. C. Clark, Bureau of Public Roads, Washington, D. C.

Public-Works Planning

Twelve national organizations have named representatives to serve on the Public Works Construction Advisory Committee of the General Services Administration. Jess Larson, Administrator of General Services, said: "In carrying out the public-works functions transferred to the General Services Administration from the former Federal Works Agency, GSA wants to have the benefit of consultation with representatives of the leading organizations in the field of public-works planning, construction, and operation."

E. R. Purves, Executive Director of the American Institute of Architects, is the committee Chairman, and F. S. Fitzpatrick, Manager, Construction and Civic Development Department, Chamber of Commerce of the United States, is committee Secretary.

Other members are: Frank Bane, Executive Director of the Council of State Governments, with alternates T. G. Driscoll and Newton Edwards; Colonel Paul Betters, Executive Director, United States Conference of Mayors; J. H. Ehlers, Field Representative, American Society of Civil Engineers; C. H. Chatters, Executive Director, American Municipal Association, with alternate Donah Hanks; H. E. Foreman, Managing Director, Associated General Contractors of America, Inc.; R. J. Gray, President, Building and Construction Trades Department, American Federation of Labor; H. H. Hale, Executive Secretary, American Association of State Highway Officials; S. L. Kerr, American Society of Mechanical Engineers, with alternate M. X. Wilberding; C. M. Mortensen, Executive Secretary, the Producers' Council; and W. A. Xanten, President, American Public Works Association.

CARE, a non-profit agency, has a program to help rebuild the wrecked libraries of Europe and Asia. Contributions of money may be sent to CARE, 20 Broad St., New York 5, N. Y.

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"The hills, Frupp!! The everlasting, never-changing hills!"

New Jack Scheme For Slip-Form Work

Automatic Self-Leveling Electric Jacks Created To Boost Efficiency on Grain-Elevator Addition

By RAYMOND P. DAY,
Western Editor

(*Photo on page* 1)

✦ "FOR thirty years slip-form men have tried to invent automatic jacks which were foolproof. We believe we've done it for the first time!"

In those two sentences, L. H. Jefferson explained an accomplishment which has changed the concrete-handling methods of his company, insofar as it applies to slip-form work. Jefferson is Vice President of Jack Construction Co., Inc., of Kansas City, Kans. His firm builds all over the country, and is a specialist in the type of building work ordinarily done by the slip-form method.

The contract on which the revolutionary method was used successfully was a sizable enlargement and modernization to the grain-storage facilities of Salina Terminal Elevator Co., in Salina, Kans. The Jack Construction Co., Inc., contract included a new head house 21 x 48 x 204 feet high, and ten 100-foot round grain-storage tanks with a diameter of 23 feet. All the buildings are of reinforced-concrete construction. The undertaking also included the operating machinery for the tall head house, such as a 2,500-bushel hopper scale, plus car dump pits on each side of the new addition.

For many years men have poured concrete buildings of this type with the aid of slip forms: sliding wooden forms which climb up a series of jacking rods as the concrete work progresses. These forms climb slowly enough to let the concrete harden underneath. A building pour, once started, seldom stops until it is finished.

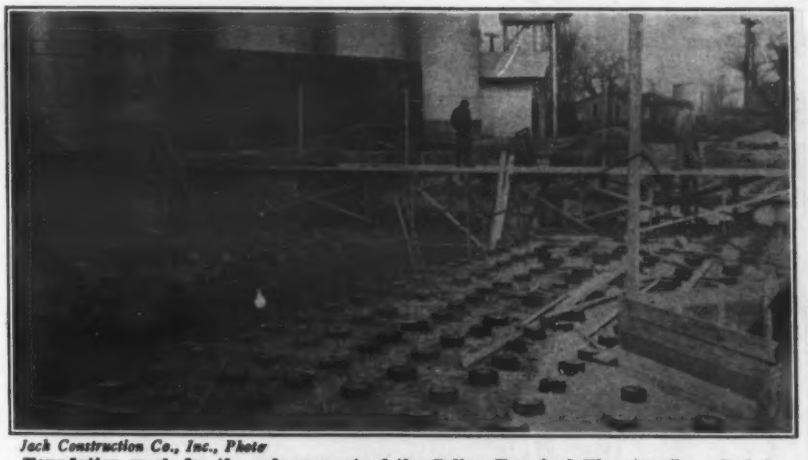
It took many men to operate the old-style manual jacks. For example, it took one man for not more than eight jacks. On the big Salina project, the crew was reduced by at least 33 per cent. An electrician with two helpers handled all the jacks, and 164 were used on the main pour.

How They Work

The sliding slip form on this project was built of 1-inch tongue-and-groove sheathing, reinforced by nailing the sheathing to wales. Heavy timber yokes fitted over the forms, with ties to connect them to the forms. There was never any weight on the forms, except normal concrete loading stresses.

The new jacks, which have now been patented, were set on top of the timber yokes. A 1-inch steel jacking rod passed through the yoke and through the driving machinery of the jacks. When a pour was in progress, many jacks working in unison simply climbed these rods like monkeys climbing ropes. They carried the forms, a finishing scaffold, and the building's roof.

(*Continued on next page*)



Jack Construction Co., Inc., Photo
Foundation work for the enlargement of the Salina Terminal Elevator Co. called for 1,200 creosoted-wood bearing piles.

Use CONCRETE TERMITE *Rotary* DRILLS and save time and money on every job! TERMITES hold their gauge, bore hundreds of holes—clean, true and fast. Fit any ½-inch electric drill. Pulverizing action eliminates noise and permits drilling close to edge of concrete without breakage. Three types of drills handle all drilling jobs in masonry, concrete, tile or brick . . . give you more holes per dollar.

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GIVE!

Now—
super mileage plus super traction
NEW
Hi-Miler
XTRA TRED

UP TO 50% MORE MILES

In non-skid tread alone the new XTRA TRED (right) is as much as 50% deeper than regular heavy-tread tires—that's a lot more rubber.

UP TO 60% MORE TRACTION

Scientific tests of all leading makes of heavy-tread truck tires proved the new XTRA TRED to be as much as 60% more effective in road-holding ability.

HERE'S the new super-performance, safer truck tire that truckers everywhere have been waiting for—Goodyear's new Hi-Miler Xtra Tred. It combines *both* super-skid-protection and super-mileage right in the same tire.

The new Hi-Miler Xtra Tred provides up to 60% more skid resistance than other heavy tread tires because: It has a flatter tread with zigzag grooves and notches to provide more and better road-gripping edges.

The new Hi-Miler Xtra Tred provides up to 50% more mileage than regular heavy-duty tires because: The depth of non-skid tread alone is as much as 50% greater—greater tread depth and flatter tread contour mean longer wear, extra miles, extra protection from punctures, extra value.

You're missing a bet if you don't try the new Hi-Miler Xtra Tred—available in either rayon cord or super-durable, extra-heat-resistant nylon. Compare it point for point with any other heavy-tread tire made, the results will amaze you.

Ask your Goodyear dealer now for the new truck tire that gives you up to 60% more skid protection—50% more mileage—Goodyear's *new* Hi-Miler Xtra Tred.

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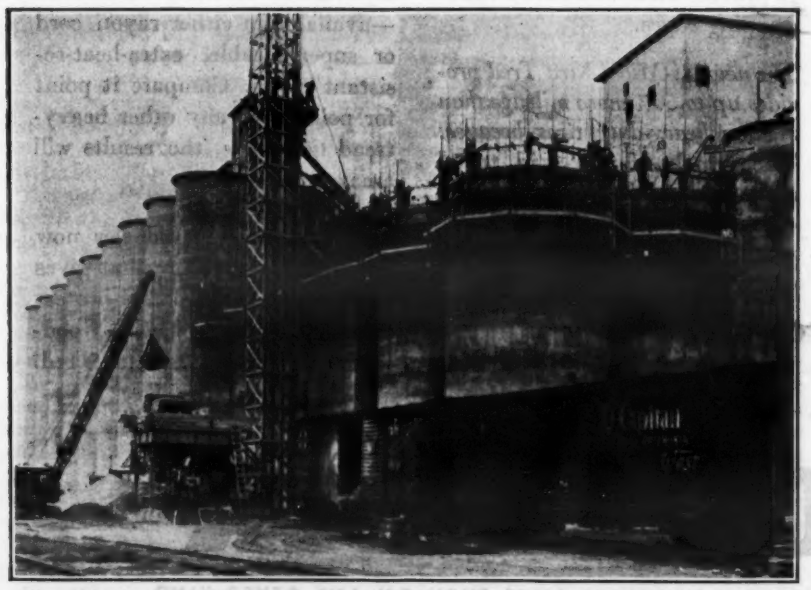
GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

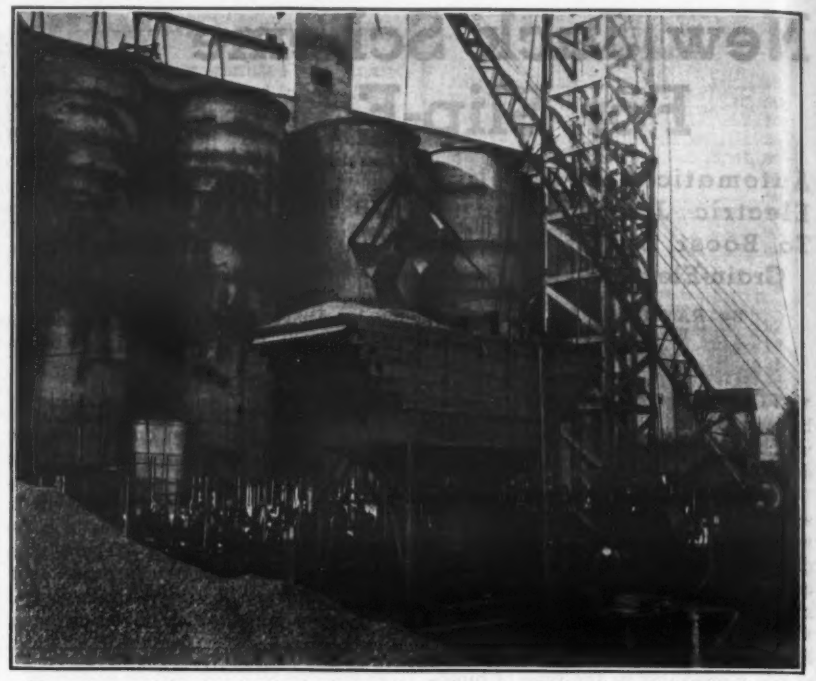
Hi-Miler, Xtra Tred—T.M.'s The Goodyear Tire & Rubber Company

Concrete starts down a chute to a deep foundation pour on the Jack Construction Co. contract to enlarge grain-storage facilities for the Salina Terminal Elevator Co.

L. M. Jefferson, Vice President of Jack Construction Co., examines some of the automatic self-leveling electric jacks which were the key to the efficient slip-form work.



The grain-storage tanks take shape as the slip forms climb the jacking rods lift after lift. Concrete buckets are carried up to the pour in the timber hoist tower.



Here at ground level is the beginning of the main pour. Notice the special slip forms, as well as the flatcar-mounted Winslow batch bin and CMC 16-S concrete mixer.

New Jack Scheme For Slip-Form Work

(Continued from preceding page)

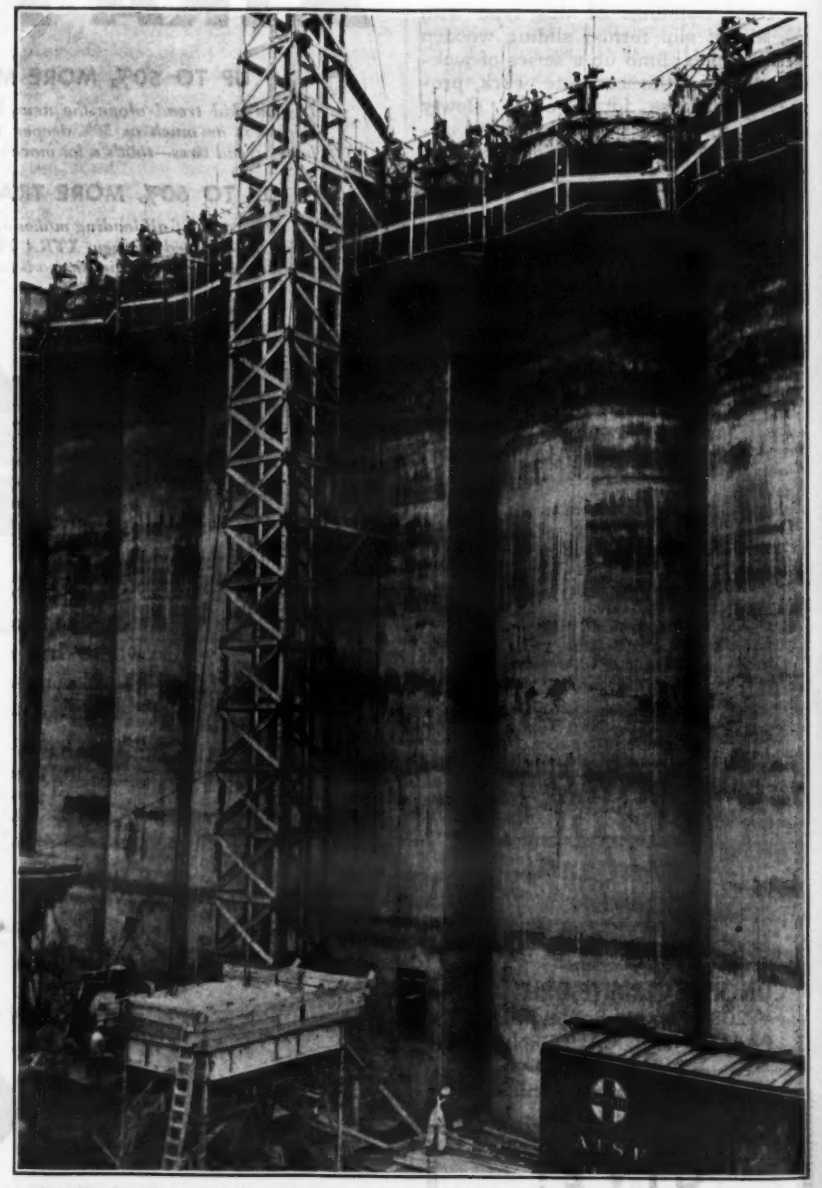
Each jacking machine had its component parts mounted firmly on a piece of steel channel iron, and the section near the jaws rested on a welded steel plate. Each machine consisted of a small 1/12-hp electric motor, geared down through a gear-reduction box with a ratio of 9,576 to 1. A connecting rod with two settings transmitted the power of the motor to steel jaws which gripped the jacking rod. Although each jack normally exerted a lifting force of only 3 tons, tests showed that they would each lift 40 tons.

The connecting rod, pinned in the first hole, permitted the jack to move at a rate of 12 fph. In the second position it would go twice that fast. The motors were all bought from war-surplus agencies, and converted from 24-volt operation to 110. Originally these motors operated delicate controls on P-40 fighters.

As happens with any new invention, this one contained "bugs". It doesn't

Jack Construction Co., Inc., Photos

(Continued on next page)



The slip forms rose at the rate of 9 inches an hour during 80 per cent of the job. Beneath them, you will notice, is a platform scaffold from which finishers worked.

Jack Construction Co., Inc., Photos

Bearing piles for the grain-storage tanks refused to penetrate the hard formation in a straight line. So this Ford-mounted auger drilled pilot holes for them.

seem to have them now. The gross weight of a jacking unit has now been reduced from 206 to 143 pounds. The power-transmission arms and jaws are now made of 66,000-pound-test cast chrome and nickel steel. The motor has been so located that a man can jerk it out and put in a new one in only 2 minutes. And a whole jacking unit can be changed in 15 minutes or less.

A big part of this radical new idea is the electrical system which controls the operation of the jacks. It is based on the theory that building lines will be plumb if all jacks move up in perfect unison. The electrical control system gets that result.

This control system consists first of all of a water barrel, which is carried along on a jacking rod. It can be raised to whatever height the electrician wants to move the forms. Flexible rubber tubing leads from this water barrel to the various jacks. One hose will serve about six jacks. Hose leads pass through Y-connections to a short float well under each jacking machine.

A cork float inside this float well actuates a mercoid switch inside the jack control box. When the electrician wants to raise the slip forms say 4 inches, he simply jacks his master water barrel up that far. The water comes up in the float well, the mercoid switch turns the power on, and the jack begins to operate. It continues to operate until the machine has raised itself up to the level of the control barrel. Then the contact breaks and the jack stops. Due to friction losses in the hose, and minor variations in the operating characteristics of each machine, the jacks seldom stop simultaneously. But when the last jack has stopped operating on that lift, *all are perfectly level,* automatically. And that is the big secret.

There is no uneven movement; no "racking" of forms to compensate for uneven movement. The forms slide so slowly and imperceptibly that no one is conscious of their movement. The steel jaws bite slightly into the steel jacking rods, and they seldom slip.

Possibly another part of the invention is the scheme of joining the jacking rods. These rods come in 16-foot lengths. The ends of each rod are threaded to a depth of about ¾ inch. A short threaded stud with unthreaded ends is screwed to the top of the rod being used. Then when the concrete gets that high, another rod can quickly be screwed over the threaded dowel stud, joining the ends firmly. Hooked J-bars are also used to brace the jacking rod if it passes through an opening of some kind, and cannot be strengthened with concrete.

Foundation Goes Deep

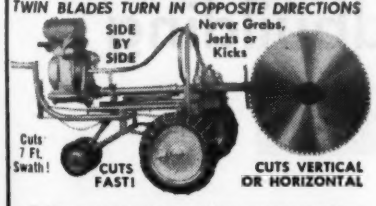
Foundation work under the new expansion called for excavation to a depth of 30 feet below ground level, and 1,200 creosoted-wood bearing piles.

(*Continued on next page*)

JACOBS SAFETY WONDER SAW

WORLD'S GREATEST SAW INVENTION

TWIN BLADES TURN IN OPPOSITE DIRECTIONS



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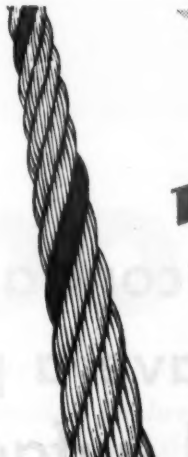

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New Jack Scheme For Slip-Form Work

(*Continued from preceding page*)

The excavation was removed by a Northwest 25 dragline, and the bottom of the hole was dressed up by a small Allis-Chalmers HD-5 carrying a Tracto-Shovel. "We didn't use a bit of manual labor on this work," said Jefferson. "Where labor is scarce you've *got* to mechanize."

A Northwest 25 crane with a 50-foot boom drove the piles, using a No. 2 Vulcan pile hammer. The elevator facilities included a steam boiler, so the hammer was hooked on to the main steam line. But the winter weather was cold, and the steam wanted to condense before it got to the hammer. A small Ingersoll-Rand mobile air compressor of 105-cfm capacity was hooked in to the steam line, and that did the trick. The hammer operated well enough from that point on to drive as much as 2,800 linear feet of piling in 10 hours.

Pile points refused to penetrate the hard formation in a straight line, so pilot holes were drilled accurately by a small Ford-mounted auger. The piles were then set up in a cluster of holes, and when several hours of driving were assured the crane picked up the pile hammer and went to work.

Dual Concrete Set-Up

A concrete plant with all of its chief parts duplicated was set up to insure continuous round-the-clock operation when concrete placing once started. The set-up consisted of a Winslow batch bin with Winslow scales, and a CMC 16-S concrete mixer. These two machines were mounted on a railroad flatcar and were 100 per cent mobile as they placed the foundation concrete.

The Winslow batcher and the 16-S concrete mixer were duplicated with a spare in each case. Thus if the concrete mixer should break down, a spare machine in good running order was there to take its place.

Limestone aggregate from eastern Kansas was used, because it absorbs water from the mix so well and hastens the hydration of the concrete. Local sand from the Smoky Hill River bed was trucked in to the batching set-up. Ash Grove air-entraining cement was used. It came in by railroad in sacks, and was unloaded at the mixer.

When concrete work was at its peak, the crew used 36 carloads of limestone aggregate per week. That's a lot of aggregate in anybody's language to pass through a 16-S mixer, but it was done. A Bay City crane kept the aggregate and sand bins charged.

Hoisting equipment to raise the concrete to work level consisted of a 2-drum Clyde hoist, electrically powered. A timber tower 204 feet high above ground level was built to carry the concrete bucket up to the pour. The first 90 feet of this tower was built on the ground. Weighing 10 tons, it was lifted bodily and set in place. Then the remainder of the tower was built and guy wires tightened.

On the evening of May 16, just after the main pour containing all ten storage bins and the head house up to the 100-foot level had been completed, a hard wind ripped into Salina. Anemometers at the Salina airport registered wind velocities on the ground of 65 mph. What it was at the top of the tower no one will probably ever know. At any rate, a vicious gust of wind put such a strain on one guy cable that a 1¼-inch steel anchor bolt sheared like matchwood. The tower split in several pieces, crashing down over the railroad tracks. Fortunately, it missed the batch plant, near-by power lines, and railroad buildings.

A steel gin pole then had to be used to finish up the head house, rigging the hoist cable through a sheave at ground level and up over another sheave on the steel frame.

Concrete Placing

The foundation concrete was placed first, much of it directly from the mixer. A railroad spur parallels the grain-elevator buildings, and the flatcar could be moved wherever it was needed.

A rigid support to carry the forms for the various roofs was built next. The concrete roof was not poured until the walls were completed. The work deck was then used as a form for the roof. The roof foundation was carried up as construction of the walls progressed, and it served as a platform for the men to use as they worked.

The slip forms were then attached to the yokes, and the pour was ready to start for the top. These slip forms are only 4 feet high, with about 6 inches of splashboard at the top.

All ten grain bins and the head house in the center were poured simultaneously. The forms were filled, slowly, and soon the jacks were turned on, starting them upward. The outside section of a slip form hung vertically, but the inside form had 3/32-inch batter per foot to allow the thing to slide.

As the mixed concrete left the mixer, it was carried up to the platform level and dumped to a transfer hopper. Men with rubber-tired concrete buggies quickly hauled it to the forms, where it was dumped in the narrow 6 and 7-inch openings. The concrete had to be carried level all the way around to equalize the load, and also to permit reinforcing steel hoops to be placed. From ½ to ¾-inch steel reinforcement was used here, spaced every 6 inches near the bottom of the grain silos. Vertical reinforcing steel was carried up along with the jacking rods, which also stayed in the concrete.

Concrete work on this project figured 22 cubic yards per foot of height. Ordinarily the crew would place a foot of concrete in an hour. They averaged 9 inches per hour for the first 80 per cent of the concrete work.

All the time concrete work was under way, the jacks made repeated lifts. As the forms went higher, cement finishers working from a platform scaffold beneath the slip form finished the green concrete. They used wood floats and sometimes wire brushes. A dense, slightly rough surface finish was made. The concrete on this project came out very uniform in texture and color, and the buildings when checked with a transit at the 100-foot level were less than ½ inch out of plumb.

One of the little tricks slip-form men use to make the concrete set up rapidly is to give the concrete a little extra time in the mixer. They find that a batch of concrete mixed about 5 minutes will set up fast. Strength reports show that this does not hurt the concrete, either. The 5½-sack mix, with 5½ gallons of water per sack, gave strength tests up to 4,200 pounds in 28 days.

And then the weather, of course, plays a big part in the speed of placing. On a chilly, damp night the concrete

(*Concluded on next page*)

Every Secondary Road can have a properly paved surface...

Every Airfield can have adequate paved runways...

Every Major Highway can incorporate durable paved subsurface and shoulders...

WOOD controlled mix-in-place roadbuilding is the answer!

won't set up as fast, and the crews have to slow down. But along about noon when the hot sun beats down, they can step up their progress a great deal. Seventeen feet per day was made on this contract.

There were 164 jacking machines in use when the main pour was made, and only 49 when the head house was finished 204 feet above the ground.

When the tops of the buildings were reached, steel pins were then driven into the concrete, and after it had set up, the jacks were lowered slightly to set the roof down. That finished up the visible outside work. From that point on, it was a tedious job of installing various floors and machinery in the head house.

Jack Construction Co., Inc., is mechanizing its concrete operations as near 100 per cent as possible to whip the short-supply labor situation. Despite the recession and its resultant excess of labor on both coasts, men are still hard to get in the midwest. The new automatic jacking method lowers costs, boosts efficiency, and permits speedier completion of jobs. This one, started February 25, 1949, was handling grain in July of this year.

The company is currently working out a scheme of mechanized concrete placing from tower to forms. When it is perfected, this will eliminate buggy men and other such typical members of a concrete crew.

Jefferson spends a great deal of his time in the field, and on this project conducted a company school to acquaint all the company's key men with the operation and maintenance of the new jacks. As more of the machines are built, they will be leased out to other contractors on similar work.

Nelson, Beggs & Eidson of Kansas City, Mo., performed all engineering design, and George Black was General Superintendent.

U. S. Savings Bonds are security bonds. Their purchase provides for your personal security as well as the economic security of the country.

Redesigned Magnets

Redesign of the complete line of Eriez permanent non-electric Standard and Jumbo plate magnets has resulted in a 50 per cent increase in magnetic strength and a 30 per cent decrease in weight. These magnets are made by the Eriez Mfg. Co., 1057 E. 12th St., Erie, Pa.

The new magnets consist of a series of Alnico castings designed to obtain the greatest external energy possible. The improvement in these units is the result of design, newly developed Alnico material, and new charging techniques. These plate-type permanent magnets will remove tramp iron from materials traveling in chutes and spouts or in pneumatic lines, and provide protection for machinery.

Both models are available for installation in metal or wooden chutes, feed tables, hoppers, etc., with or without hinges. Sizes range from 4 inches to 72 inches wide, in increments of 2 inches. Larger units or special shapes are also available. Magnetic strength is said to last indefinitely and all units are fully guaranteed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 54.

Post-Hole Diggers

A line of post-hole diggers is being made by the Roper Mfg. Co., Walnut Drive, Zanesville, Ohio. All models are basically the same, but each has special features suited to a particular job. The gear drive of the unit runs in an oil bath and the rotating digger shaft is completely cased in a cast-steel housing with bearings at three points. As a safety feature, a special easily replaced shear pin will break if the digger is overloaded. The Roper fits all wheel tractors with hydraulic lifts.

The regular model is designed to dig holes up to 30 inches. Interchangeable blades of 8, 10, 12, 14, 18, or 24-inch diameters may be used. This model is recommended for tree and shrub planting. The Super and the Delux models are designed to dig in tough terrain; the latter being the most rugged model. They have a double cutting-edge blade with a double continuous flight. Augers for these are interchangeable and are available in 8, 10, 12, and 14-inch diameters, and an 18-inch blade for the Super model only. These models are recommended for digging holes up to 42 inches deep for fence posts, footings, ditches, trenches, and other heavy operations.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 84.

Concrete-Pipe Machine

A 20-page catalog, highlighting the Model T pipe machine, is offered by the Concrete Pipe Machinery Co., P. O. Box M-1000, Sioux City 19, Iowa. Pipe-making machinery, pipe-handling equipment, and auxiliary plant equipment are covered. Description, specifications, suggested methods for economical operation, and photographs of the equipment are presented.

The Model T bell-up McCracken machine makes pipe in sizes from 4 to 30-inch, with a bell-and-spigot joint, and from 4 to 36-inch with a tongue-and-groove joint. The process uses a packer-head for sizes 4 to 10-inch and a roller-head for 12 to 36-inch. Plain concrete pipe is made in sizes up to 24-inch and reinforced in sizes from 12 to 36-inch.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 13.

For Uniform Concrete Mix

A new data sheet on the use of Dicalite in concrete construction is now available from the Great Lakes Carbon Corp., Building Products Div., 18 E. 48th St., New York 17, N. Y. Dicalite is designed to make concrete more workable and more uniform. It is a lightweight powdered material, packaged in bags, and is added at the mixer with the other dry material. The data sheet explains in detail the features of Dicalite and recommends the amounts of it to be added per bag of cement.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 81.

Protective Coatings News

Protective Coatings Division of Pittsburgh Coke & Chemical Co. announces the opening of a new office at 711 Thompson Bldg., Tulsa, Okla., to serve the central midwest. Frank E. McNulty, former manager of the Koppers Co.'s Tulsa office, is manager of the new office.

Appointment of Benjamin H. Means as Service Manager of Protective Coatings for the entire United States has also been announced.

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controlled mix-in-place roadbuilding

provides paved construction at low cost because in 9 out of 10 cases you can use the native sand, soil, clay or rock aggregate for your mix!

Good paved surfaces can be built for as little as one-third the cost of normal hard-surfacing methods. Every day roadbuilding engineers and contractors are proving this fact—proving it with Wood mix-in-place construction.

Sandy loam makes well surfaced runways for a Staten Island airport...native gravel produces an important Missouri highway...sand-shell mixture creates a first rate airstrip in Texas...Georgia clay is converted into miles of smooth rolling highway in the Peach State.

Throughout the United States and in countries scattered over the Globe, Wood mix-in-place roadbuilding equipment is making first quality surfaces from all kinds of lesser quality natural aggregate. You may be surprised to find how many of *your* surfacing requirements can be handled, faster, better and cheaper by the Wood controlled roadmix method. Write today for full information.

Wood Model 36 Self-Propelled Roadmixer

WOOD MANUFACTURING CO.

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The Triplex backfill tamper is designed to do the work of three individually operated tampers. It is built around an equalizer mounted vertically in a triangle formed by three tampers.

Triple-Shoe Tamper

The Triplex backfill tamper, a high-speed high-lift unit, is built to do a three-man job with only one operator. It is constructed around an equalizer which is mounted vertically in the triangle formed by three tampers. The Triplex, manufactured by Gundersen-Taylor Machinery Co., 970 Cherokee St., Denver 4, Colo., will not consume more than 105 cubic feet of air per minute at 100 psi and 8,500-foot elevation, according to the company.

The manufacturer claims the one-man-operated Triplex will do the same job as three individually operated tampers, and in less time. The shoes are mounted at the corners of a right triangle, with the 90-degree angle at the front. For safe operation, the shoes are far from the operator's feet and the Triplex has less than ½-inch vertical movement when tamping.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 96.

Chains for Winter Wear

A new booklet and price list, Bulletin 148, on Cleveland Master Grip and Sterling-Wearwell tire chains, is announced by the Cleveland Chain & Mfg. Co., 545 Henry St., Cleveland 5, Ohio. The booklet describes chain construction features in detail and contains complete tables of all chain sizes. Repair parts and accessories are also listed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 52.

Ball-Bearing Units

Sealmaster ball-bearing units are described in a catalog issued by the Stephens-Adamson Mfg. Co., of Aurora, Ill. These bearing units are pre-lubricated, self-aligning, and feature the permanent Sealmaster centrifugal labyrinth seal which, the company says, keeps out dirt and retains the lubricant.

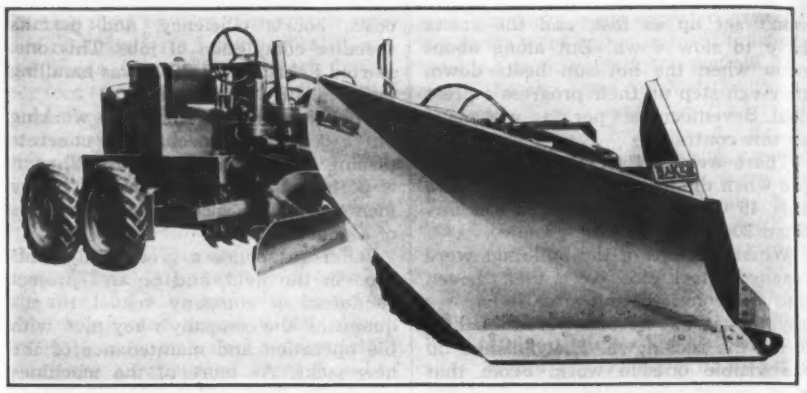
The booklet gives engineering data on the ball bearing, load capacity, bearing life, mounting instructions, and suggestions for the lubrication and care of the units. Load ratings for normal-duty units and dimensions for all models are also included. Photographs and cutaway drawings illustrate the features in design and construction of the Sealmaster line.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 144.

Equipment Lubrication And Maintenance Guide

The third edition of "Lubrication and Maintenance Guide for Contractors' Equipment" is available from the Gulf Oil Corp., 3800 Gulf Bldg., Pittsburgh 30, Pa. The recommendations it makes are for various power and other units which may be found in any given type of equipment. These general recommendations are intended to serve as a guide for the proper lubrication and maintenance of particular pieces of equipment. The booklet is 100 pages long.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 90.



This Baker V-type snow plow is specially designed for the Allis-Chalmers Model D grader. It is flexibly attached to the push bars and hydraulically adjustable.

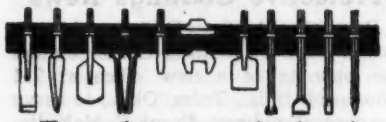
Grader Snow Plow

A V-type hydraulically controlled snow plow, Model 277, made by Baker Mfg. Co., 10th and Stanford Ave., Springfield, Ill., is especially designed for the Allis-Chalmers Model D motor grader. The new V-plow is 8 feet wide at the bottom and 9½ feet wide at the top. It is flexibly attached to the push bars and hydraulically adjustable for snow-moving positions.

Further information on the new Baker plow may be secured from the company. Or use the Request Card at page 16. Circle No. 68.

"BICKNELL BETTER BUILT"

PAVING BREAKER TOOLS



We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.

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EVERY contractor knows that profits on a job go up as downtime goes down. You make more money when you meet or beat the deadline.

Firestone tires have cut the downtime on thousands of jobs because they are the toughest tires built . . . because Firestone Service is always on hand to keep them on the job . . . we call it "On-the-Job-Service."

There is a specially built Firestone tire for every off-the-highway job . . . the tough, extra traction Rock Grip for rock work and strip mining; the Ground Grip for traction power in dirt or soft going; the Earth Mover for maximum flotation under big loads on free rolling wheels.

Ask your Firestone Dealer or Firestone Store to give you the complete information on Firestone Off-the-Highway tires. Let him prove to you that he can cut your downtime and increase your profits. When you buy new tires or new equipment, specify Firestone Tires.

Listen to the Voice of Firestone every Monday evening over NBC

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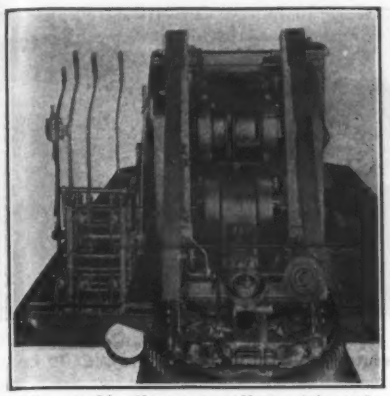
Because THEY DO THE JOB
and STAY ON THE JOB!



The combination power dipper trip and automatic tagline winder shown here has been engineered for all Quick-Way truck shovels and clamshells.

Power Dipper Trip And Tagline Winder

A combination power dipper trip and automatic tagline winder has been announced by the "Quick-Way" Truck Shovel Co., 4150 Josephine St., Denver 5, Colo. The unit is engineered for all Quick-Way truck shovels and clamshells.

Features claimed for the attachment as a tagline winder are: accurate loading and casting without moving boom or machine, automatic tagline pull, adjustable pull at and below machine level, quick-acting manual control to manipulate clamshells or grapple.

As a power dipper trip for shovel and scoop attachments, this unit is said to save time and operator effort. It is quickly installed inside the cab, the manufacturer says, without any major changes. In addition to protecting the attachment from weather, this installation avoids placing extra weight on the boom.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 113.

Sound and Color Movie Depicts Cement Making

Every step in making portland cement, from quarrying or dredging raw material to the packing operation, is covered in a 30-minute sound and color motion picture entitled "The Drama of Portland Cement", released by the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill. The scenes for the movie were made in many different and widely separated plants.

The first part pictures and describes the dramatic processes of cement-making. The second shows how scientific research in laboratories and engineering work in the field are constantly improving the product. Intimate views of research scientists at work in the Portland Cement Association's headquarters in Chicago are shown for the first time. The concluding phase of the picture illustrates the application of portland cement in building concrete highways and many notable structures in various parts of the country.

The picture, on 16 mm film, is available without cost to civic and business clubs, architectural and engineering colleges and societies, contractor associations, and church groups.

Exhaust Protection Cap

Fully automatic exhaust protection for your engine is described in a folder now offered by the C. R. Taylor & Co., Box 221, Garden City, Kans. This device, called the Weathercap, is designed to fit every size exhaust from 1½ to 5¾ inches. Offered as optional equipment is a nest of bushing rings which enables the dealer to fit every ⅛-inch graduation between standard sizes.

The Weathercap is said to open automatically with the first slight pressure of the exhaust and to close the instant the engine is stopped, at all parking angles. The folder describes these and other features of the Weathercap, as well as its installation.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 128.

ARBA Head Appoints A Road Show Committee

Col. E. R. Needles, President of the American Road Builders' Association, has appointed the 1952 Road Show Committee. This committee will study possible locations, dates, and the type of program to be planned for the 1952 highway industry exhibition. Members of the committee include: H. G. Sours, consulting engineer, Chairman; E. P. Phillips, Phillips Machinery Co.; R. M. Reindollar, Chairman of the Maryland State Roads Commission; W. A. Roberts, Executive Vice President of Allis-Chalmers Mfg. Co.; G. E. Spain, Vice President, Caterpillar Tractor Co.; R. K. Stiles, Executive Vice President, Austin-Western Co.; and N. L. Teer, Jr., Vice President of Nello L. Teer Co.

The Dallett Dal-edge Moil Point

By employing the practical wedge principle to the Dal-edge Moil Point Dallett gives you a tool that will break pavement and concrete with greater efficiency than was ever possible to obtain with conventionally designed Moil Points.

Wedge Design Spreads Fracture Easier — Quicker

From the moment the point of the tool enters the concrete, wedge design progressively widens the fracture as power is applied. The wider part of the tool shatters the penetrated area. Forged by Master Craftsmen, Dal-edge Moil Points have the tradition of 66 years of Quality Toolmaking behind them.

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DISTRIBUTORS in principal cities throughout the United States, Canada, Europe and South America.

3½-yard ESCO Cast-Welded Dipper on Lima 1201 with 32'6" boom, and 22' dipper stick, excavating sand and gravel in California quarry.

All Muscle ...no fat

Strength to lick tough jobs, but without useless weight to slow down your digging—that is the story of the *ESCO* Cast-Welded dipper bucket shown here. It means that full fighting strength remains after excess weight has been engineered out. Or, in terms of your digging jobs, it means

Greater Capacity per Pound
More Passes a Day
More Payload per Pass

A close inspection of these buckets points out the basic reasons for the performance of *ESCO* Cast-Welded dippers. It shows

Manganese Steel for Wearing Parts
Cast Alloy Hollow Back Beams
Flaring Outside Teeth for Full Bite
Streamlined Dipper Front
Tapered Box for Easy Loading and Quick Discharge

Let your nearest *ESCO* representative tell you about this all-muscle-no-fat dipper bucket. Or fill in and mail the coupon for illustrated literature. Electric Steel Foundry, 2169 N.W. 25th Avenue, Portland 10, Oregon. 720 Porter Street, Danville, Illinois. Offices in Pottsville, Pa.; Eugene, Oregon; Chicago; Honolulu; Houston; Los Angeles; New York City; San Francisco; Seattle and Spokane. In Canada, *ESCO* Limited, Vancouver, B.C.

ESCO

Dragline, Dipper and Coal Loading Buckets

ELECTRIC STEEL FOUNDRY
2169 N.W. 25th Avenue, Portland 10, Oregon
Please send catalog on your Cast-Welded Dipper Buckets to:

Name_____

City_____ State_____

Address_____ Zone_____

Make and model of machines used_____

Channel Improvement Will Prevent Floods

Creek Through Town Is Widened and Deepened; Dikes and Walls Along Sides Also Protect

By WILLIAM H. QUIRK,
Eastern Editor

✦ WITH the completion of the second major phase, early in 1949, of the Punxsutawney Channel Improvement, the Corps of Engineers, U. S. Army, Pittsburgh District, has given the little town with the big name an increased feeling of safety from periodic floods which have plagued it nearly every spring and fall. Punxsutawney, with a population of around 10,000, lies in hilly Jefferson County in western Pennsylvania. Through the town from east to west flows Mahoning Creek, which empties into the Allegheny River about 30 miles farther to the west. The average width of the creek is from 60 to 70 feet, with a 2-foot depth in the summer.

Because of the surrounding hills, with a subsequent rapid run-off, the creek rises quickly—especially during the spring break-up of ice and snow in the high surrounding area, and also during a rainy fall season. Then the creek easily spreads out to a width of 150 feet, with a 6 to 7-foot depth. On such occasions, adjoining streets are covered with the overflow from the creek. The greatest flood occurred on March 17, 1936, when the entire downtown business district of Punxsutawney was 6 feet under water.

While the greater portion of the town lies on the north or right bank of Mahoning Creek, there are important commercial concerns also located on the left bank, together with a sizable residential section. U. S. 119 runs north and south through Punxsutawney, crossing the creek at Indiana Street. Both the Pennsylvania railroad and the Baltimore & Ohio railroad likewise go through the town. The creek is crossed by 7 good-sized bridges—4 vehicular and 3 railroad spans. In order from west to east they are: Pennsylvania Railroad Bridge; Margiotti Bridge; B. & O. Railroad Bridge; Indiana Street Bridge; Penn Street Bridge; Mahoning Street Bridge; and a second Pennsylvania Railroad Bridge. In addition there is a foot bridge at the extreme eastern end of town.

Flood-Protection Projects

The first phase of this flood-protection project got under way in May, 1946, when the channel was improved for 10,000 feet, beginning at a point just west of the Pennsylvania Railroad Bridge at the western end of town, and continuing upstream or easterly to a point about half-way between the B. & O. Railroad Bridge and the Indiana Street Bridge. The work was performed under contract to the Corps of Engineers by the Mede Construction Co. of Derby, Pa., and Drainage Contractors, Inc., of Dearborn, Mich. The job was completed one year later in May, 1947, at a cost of $535,000.

This first contract included widening and deepening the channel for the length of the improvement; protecting with dumped rock the outside banks of the creek at curves in the alignment; underpinning the piers and abutments of the three bridges which were affected by the work in the channel; and relocating several sewer lines. The town was benefited at once by this initial improvement to the creek channel, but the section of the creek through the main portion of the town was still untouched, and sewers continued to back up during high water and had to be pumped out.

In connection with the overall project, a reinforced-concrete pressure conduit was constructed to carry Barret Run, a small stream emptying into the left bank of Mahoning Creek just east of the Indiana Street Bridge. This 700-foot-long 4 x 5-foot structure was built by the Ruth Construction Co. of Scottdale, Pa., at a cost of $103,000. This same company also successfully bid on Unit 2 of the main channel improvement which picked up where Unit 1 ended and continued easterly for 4,400 feet, past the Indiana Street Bridge and as far as the Penn Street Bridge. This contract covered the main downtown section of Punxsutawney, and will be described in further detail in this article. Work on Unit 2 started in April, 1948, and was completed early in 1949 at a cost of $999,000. This stretch of channel is known as Section A.

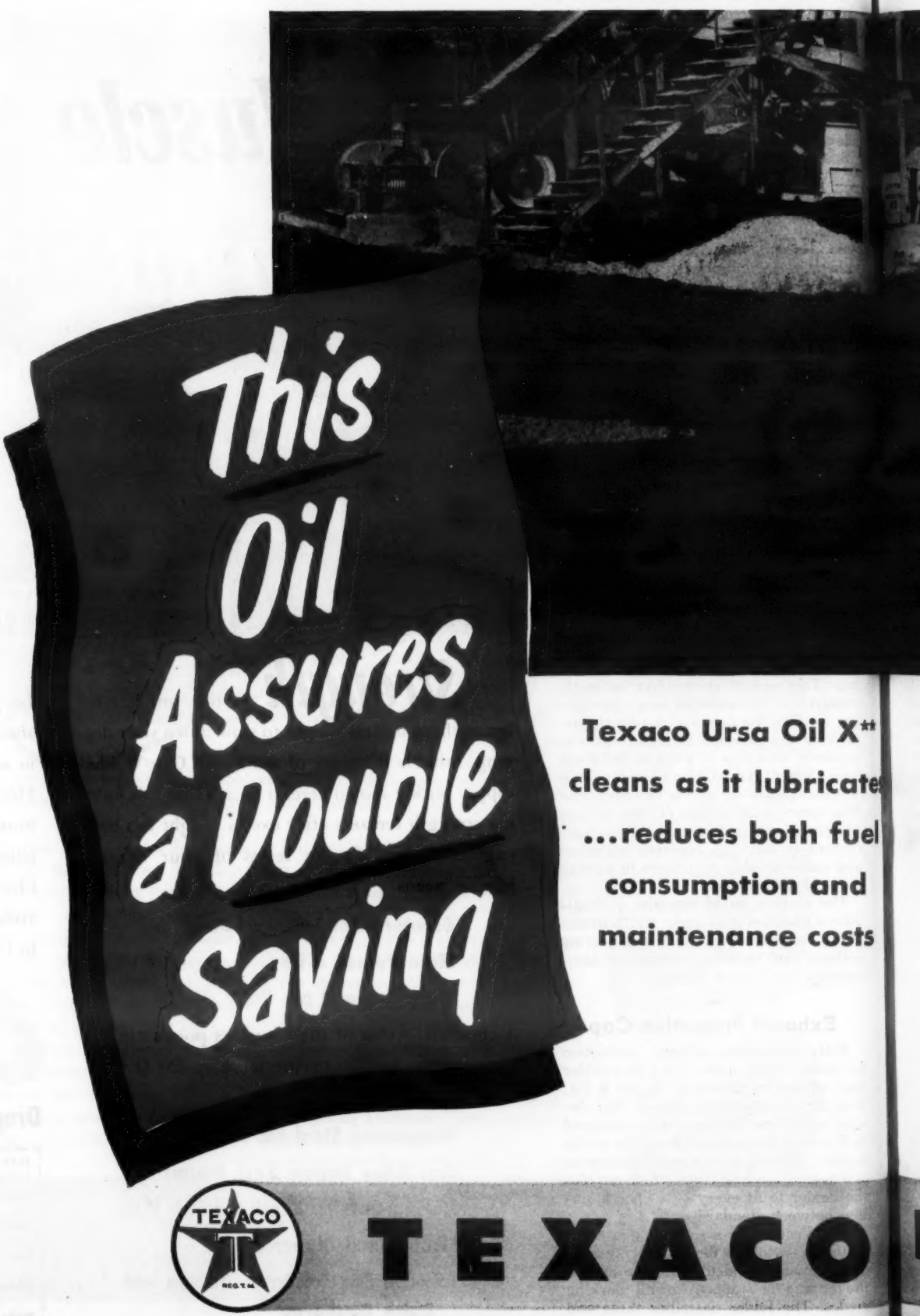
C. & E. M. Photo
Athey wagons are loaded by a Northwest 1¼-yard shovel at the edge of Mahoning Creek during dirt work on the Punxsutawney flood-protection project.

Section B of Unit 2 is a continuation of the channel improvement for 4,225 feet farther to the east beyond the last Pennsylvania Railroad Bridge at the edge of town. No contract had been let when the project was visited but when this remaining portion of the channel has been widened and deepened, Punxsutawney residents need no longer fear the rising waters of Mahoning Creek.

Major Contract

The contract for the 4,400-foot channel improvement which the Corps of Engineers awarded to the Ruth Construction Co. covered the most impor-

(Continued on next page)



tant part of the 3½-mile stretch of creek running through the town. Probably the most important section of the contract called for the widening and deepening of the channel. Roughly, the channel was widened about 40 feet on each side, making the new width 140 feet with an approximate depth of 6 feet at the center, and having 1 on 12½ slopes out to the edges of the creek. Additional protection is given along the banks of the new channel with either earth dikes or concrete floodwalls.

Only in two places where space was limited did walls have to be erected instead of dikes. One location was on the left bank, where 107 feet of wall was built around the brick buildings of the Punxsutawney Beef & Provision Co. slaughterhouse plant. The other section of wall, 176 feet long, protects several oil tanks on the right bank of the creek. Both walls lie between the Indiana Street Bridge and the Penn Street Bridge, and are 15 feet high of cantilever-type design.

Over the rest of the contract more area was available, and so dikes were constructed for the added necessary protection instead of walls. The earthen embankments were built to the same height of the wall, i. e. elevation 1,233, with a top crown width of 10 feet and 1 on 2 side slopes. The design top elevation is 2 feet higher than that attained by the 1936 major flood of record, giving the project a 20 per cent safety factor. The entire right bank of the channel in this contract has either wall or dike protection; on the left bank between the Indiana Street and Penn Street Bridges, there is either wall or dike. Below the Indiana Street Bridge no dike was required along the left bank, but dumped rock on the curves of the channel affords protection against wash and erosion.

Drainage and Bridge

With the new dikes and floodwalls, the flow of sewers into the creek was cut off. This condition required the relocation of 1,340 linear feet of 30-inch reinforced-concrete sewer pipe, and the construction of a new pumping station. During times of flood, the station pumps sewage over the sides of the dikes. At other times the sewer flows directly into the creek, the end of the discharge line being equipped with a flap gate. All storm sewers passing through the dikes are of cast iron, with flap gates at the ends. Also included in the contract was the laying of a 6-inch water main across the bed of the channel from one side of the town to the other, and also the placing of a twin 8-inch sewer siphon line under the creek. The pipe was laid in the dry by diverting the flow of the creek with an earth dam, first over half the channel width and then over the other half.

C. & E. M. Photo

On the right bank of Mahoning Creek, a Gradall with a 3-foot-wide ditching bucket digs a sewer trench from the edge of the creek back to a manhole.

A new bridge, not part of the Corps of Engineers project, has been constructed over Mahoning Creek at Indiana Street to carry U. S. 119. The existing span at this location had to be replaced because of a shift in the alignment of the channel away from the right bank, thereby straightening out a reverse curve. The new structure was built by Osborn, Inc., a Franklin, Pa., contractor, under contract to the Pennsylvania Department of Highways. Five buildings were moved during the construction. A long approach fill on the south side of the bridge provided a disposal area for surplus material that was excavated from the channel during the widening and deepening operations. Most of this excavation was unsuitable for use in the dikes, since they were built of impervious material.

During the construction of the new Indiana Street Bridge, with the original span already removed, a crossing of the creek at this point was provided by the bridge contractor with the erection of a timber and wire suspension bridge for pedestrians across the channel. The temporary structure was set up at Gilpin Street, just east of Indiana Street.

Where land was taken for channel-widening purposes, the necessary right-of-way was provided by the Corps of Engineers. Land on which dikes or floodwalls were erected was acquired by the local authorities. All told, seven buildings were moved in connection with the channel improvement, but this was handled by the town since the dikes and not the widening were involved.

Dirt Work

Channel excavation started on the downstream end of the job and progressed towards the upstream end. The original banks of the creeks were flattened out with 3 International TD-18 tractor-dozers equipped with Bucyrus-Erie blades, and the loose material was then picked up with a P&H dragline equipped with a 55-foot boom and a 1½-yard bucket. The dragline loaded to a fleet of six 10 to 14-yard Athey wagons pulled by Caterpillar DW-10 rubber-tired tractors which hauled the material either to the highway fill, or to places along the channel-widening sections where random fill could be disposed of. The hauls ranged from 1,000 to 2,500 feet.

As the level of the creek fell during the late spring and summer, the dozers worked farther out in the shallow waters of the channel, pushing the material to within reach of the dragline on the shore. When the stretch between the two bridges was reached, a hard shale was encountered in the bed of the creek. This material was first loosened up with a Bucyrus-Erie ripper pulled by a TD-24 tractor, and then dozed up the bank to the shore with one of the TD-18's and an HD-19. This heavier

(Concluded on next page)

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Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Channel Improvement Will Prevent Floods

(*Continued from preceding page*)

material was usually handled by a Northwest 1½-yard shovel which loaded the Athey side-dump wagons.

This shaly sandstone rock responded very well to the ripper dozer blades and shovel, but a couple of wagon drills, a Chicago-Pneumatic and an Ingersoll-Rand, were kept on the job for use if the rock got too hard. Air was supplied by two Worthington compressors—a 105-cfm and a 500-cfm—and a Schramm 180-cfm compressor. For short-haul bank work, up to 1,000 feet, 2 LaPlant-Choate scrapers were available for use with the TD-18 tractors.

Dike Embankments

Impervious material for the rolled-fill dikes was dug from a shaly clay borrow pit by either a Northwest 1-yard or a P&H 1½-yard shovel, and loaded to a fleet of 5 White trucks with a 6 to 8-yard capacity. The average haul to the job was 1½ miles. The material was end-dumped and spread on the fills in 8-inch loose lifts by the TD-18 dozers and compacted with at least 6 passes of a Bucyrus-Erie sheepsfoot roller pulled by an Allis-Chalmers HD-7 tractor. Occasionally the clay had to be wet down with a sprinkler truck, but for the most part it came out of the pit with the right amount of moisture for proper compaction. The sides were also strengthened with a 1-foot layer of dumped rock, 6-inch maximum size, placed on a filter course of 2-inch-down stone, 8 inches thick.

Slopes were trimmed with a Gradall which was also employed in digging ditches for sewer pipe. Mounted on an International truck, the Gradall has a telescopic arm extending out 22 feet 6 inches beyond the truck wheels. The arm is hydraulically operated by 1,200 pounds of oil pressure. Its 3-foot-wide ditching bucket, one of several attachments, holds ¼ yard and has a sloping blade.

Concrete Walls

Work on the 15-foot-high concrete walls started in August, and was finished by the end of the summer. The walls have a base 1 foot 6 inches thick by 11 feet 6 inches wide. The stem rises from the rear of the base and is 1 foot 6 inches thick at the top. The face towards the creek is vertical, while the back face has a slope of 1 on 24. When finished with the backfill in place, the stem is 7 or 8 feet above ground level; the front face is also filled in to the top of the wall with a 1 on 2 side slope, the same as that on the dike section.

Excavation for the wall base went down to rock. Forms were built with ¾-inch plywood backed by 2 x 4 studs on 16-inch centers, and with double 2 x 6 wales on from 22 to 36-inch spacings. Richmond Tyscrus, on an average of 2-foot centers both ways, tied the forms together. Ready-mixed concrete was supplied to the job by the Kurtz Lumber & Supply Co. of Punxsutawney. Truck-mixers discharged the concrete into a 1-yard bucket which was lifted to the forms by the P&H crane. The walls were poured in monoliths having a maximum length of 30 feet.

C. & E. M. Photo
On the left bank of Mahoning Creek, Ruth Construction Co. men build a floodwall to protect a packing plant.

Quantities and Personnel

The major items on the Unit 2-A contract for the Punxsutawney channel improvement of Mahoning Creek included the following:

Common excavation	133,000 cu. yds.
Trench excavation	2,500 cu. yds.
Special excavation (rock toe)	6,900 cu. yds.
Rock excavation	34,000 cu. yds.
Dumped rock	13,600 cu. yds.
Filter course	8,900 cu. yds.
Concrete for structures	1,730 cu. yds.
Reinforcing steel	124,000 lbs.

The Ruth Construction Co. employed an average of 90 on the project under the supervision of John H. Ruth, Superintendent, and Francis E. Battle, Chief Engineer.

For the Corps of Engineers, U. S. Army, E. J. Collins is Resident Engineer, and John C. Staples is Office Engineer. The work is under the direction of the Pittsburgh District which is headed by Col. F. H. Falkner, District Engineer. Wilfred Bauknight is Chief, Construction Division.

Front-End Truck Loaders

A catalog on Butler front-end truck loaders is available from The Heil Co., Milwaukee 1, Wis. The loader is mounted directly on top of the truck chassis. The dump body, of any standard make, rests on the top of the loader frame.

Shovels are of the clamshell type for positive filling. They are built in 4 and 6-foot widths, with struck measures of 12 and 14 cubic feet respectively. Diagrams illustrate how the driver controls the load distribution. Engineering drawings, photographs, and specifications are included.

This literature may be obtained from the company, or by using the Request Card which is inserted at page 16. Circle No. 5.

Drovetto Represents Tractor-Winch Concern

Steve Drovetto has been appointed a Field Representative for California and the southwest by the Pacific Car & Foundry Co., manufacturer of the Carco line of tractor winches. Mr. Drovetto will replace Jim Miller who has accepted a position with the Buran Equipment Co.

Southwest's complete, standardized line affords construction men an opportunity to fill their needs from one dependable source. From start to finish, no matter whether Allis-Chalmers, Caterpillar, International or Cletrac tractors are used, an economical Southwest unit is available to bring you increased profits.

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CHAMPION WHEELBARROW CO.
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A 5-hp independent engine, with a built-in governor, drives the sickle and its hydraulic lift on the new Toro Roadmaster mower.

New Highway Mower

A new roadside mower, the Toro Roadmaster, with independent-engine-driven sickle bar and hydraulic lift, has been announced by the Toro Mfg. Co., 3042 Snelling Ave., Minneapolis 6, Minn. The feature of this tractor mower is the independent 5-hp Briggs & Stratton engine, with built-in governor, which allows a uniform sickle-knife speed, unaffected by varying tractor speeds.

The 5 or 6-foot sickle, equipped with heavy-duty sections and guards, will make a horizontal cut from 1¾ to 10 inches high and has a cutting angle from 90 degrees above to 45 degrees below the horizontal position. The mower has a range of speeds up to 48 mph. Other features are its low center of gravity, short turning radius, hydraulic bar lift, and 10-hour fuel capacity.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 154.

New Starting Fluid

An especially prepared chemical product designed to speed up the starting of diesel and gasoline engines in any weather is now being offered by the Sta-Vis Oil Co., 500 Minnesota Bldg., St. Paul, Minn. The company claims that Sta-Vis all-weather starting fluid will, when used according to directions, start heavy-duty engines at 30 degrees below zero and in 10 seconds bring them to the point where they will run freely on regular fuel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 89.

Sectional Conveyors

A catalog illustrating and describing the new Haiss sectional conveyors, Model 487, is now offered by George Haiss Mfg. Co., Inc., division of Pettibone Mulliken Corp., 141st to 144th St. on Park Ave., New York 51, N. Y. These conveyors can be used with flat or trough belting on any type of portable or stationary mounting, elevating or horizontal. All features, accessories, specifications, and tables necessary for selecting elevating types are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 109.

Atlas Cement Co. Changes

H. P. Reid, Chief Engineer, has been elected by the Universal Atlas Cement Co. to the newly created office of Vice President of Engineering, New York, and C. B. Baker, Secretary, General Attorney, and Director, has been appointed Assistant to the President. Mr. Baker will also continue to serve in his former capacities.

F. T. Wiggins, Vice President of Sales, Western Region, Chicago, was elected Vice President and Assistant General Sales Manager, New York. G. S. Neel was appointed Western Sales Manager, Chicago. W. R. Doolittle, Jr., will succeed Mr. Neel as Sales Manager, Metropolitan Chicago Territory, and will be succeeded as Assistant Sales Manager, Chicago Territory, by T. E. Bertelsen.

J. R. Lair replaces Mr. Bertelsen as District Sales Manager, Indiana-Michigan District.

Heavy-Duty Grader

A new heavy-duty motor grader has been announced by the Huber Mfg. Co., 330 Center St., Marion, Ohio. It weighs 24,500 pounds; 25,800 with a scarifier. The overall length of the machine is 25 feet 9½ inches, width is 7 feet 10 inches, and height with cab is 10 feet 4 inches.

Features of the grader include: hydro-mechanical controls, 27½-inch front axle clearance, 87-inch shoulder reach, mechanical steering, Hercules 130-hp diesel engine, and 4-wheel hydraulic brakes. The grader has eight forward and two reverse speeds. Offered as optional equipment are an enclosed safety-glass cab; a V-type 9-tooth scarifier with a 46-inch swath width; and a 2-foot, left or right, blade extension. A closed cab is optional.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 29.

Hydro-mechanical controls, a 27½-inch front axle clearance, and an 87-inch shoulder reach are features of the new Huber heavy-duty motor grader.

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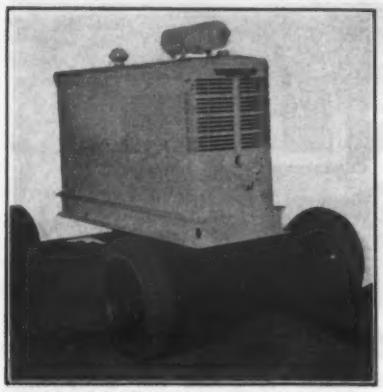

Self-contained trailer-mounted electric generators in capacities ranging from 10 to 85 kw are made by the International Diesel Electric Co.

New Trailer-Mounted Electric Generators

A complete line of fully equipped and self-contained trailer-mounted electric generator sets, in capacities ranging from 10 to 85 kw, is in production by International Diesel Electric Co., Inc., 13-02 44th Ave., Long Island City 1, N. Y. These units are specially designed for on-the-job operation. They are available in both diesel and gasoline, 50 and 60 cycles, and in all standard voltages.

These generator sets consist of an engine driving a generator, with an instrument panel containing all starting controls and switchgear, spring-mounted on a sturdy pneumatic-tired four-wheel trailer. The trailer is equipped with a steel angle drawbar for attaching to truck or tractor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 67.

Parts Are Interchangeable On Compressor and Engine

A 3-color folder covering the latest-model Schramm 105 Unistage air compressor has been issued by Schramm, Inc., of West Chester, Pa. This compressor, the catalog explains, is equipped with a Pneumastat speed governor and is powered by the Unipower engine. It may be 2-wheel, 4-wheel, skid, or motor-truck-mounted. A special feature of the model is that 90 per cent of the parts of the compressor are interchangeable with the engine parts.

Photographs of the 105 are included in this Bulletin 4915, along with design features and specifications for both the engine and the compressor.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 3.

Perforated Roller Breaks Asphalt Mat

One tool for pulverizing and reconditioning a bituminous highway mat is the Hyster grid roller shown in the accompanying picture. It is being used to rebuild a 2-mile section of U. S. 50 just west of Austin, Nev. Operators and maintenance men who work with the rig report satisfactory results.

The existing bituminous mat is first broken up by the scarifier teeth on a motor grader, and the material windrowed loosely on one half of the road. With traffic using the bare half, the special roller goes to work pulverizing the bituminous chunks.

Fines suitable for re-mixing are separated from the pile by making a pass with a motor grader, holding the blade about 1¼ inches above the ground surface. This permits fines to escape under the blade, and rolls the coarse pieces off to the side for more roller work. After the bituminous chunks have been thoroughly pulverized by the roller, SC-3 asphalt is added and the windrow blade-mixed until the new bitumen is blended with the original material.

Relaid by the grader and rolled by a steel-wheeled roller, restored road-mix is as good as the original surface.

C. & E. M. Photo

Working against a rocky cut, a Hyster grid roller pulled by a Caterpillar D7 tractor pulverizes old bituminous pavement in a 2-mile maintenance restoration operation on U. S. 50 near Austin, Nev.

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Conn. Highway Dept. Steps Out for Safety

Sets Up Safety Division To Protect Its Own Men From Accidents; Program Is Paying for Itself

By E. T. NETTLETON, Associate Highway Engineer, State Highway Department of Connecticut

+ CONNECTICUT recently took another forward step towards the prevention of accidents—this time in behalf of those who construct and maintain the highway system. All previous safety programs (and there have been many) were in behalf of John Doe who travels the highways.

John Doe is safer when traveling in Connecticut than in most other states. The cooperative programs which have brought about this record are many. For years the designing engineers in the State Highway Department have incorporated safety features in their construction plans. Patrolmen from the State Police Department and inspectors from the State Motor Vehicle Department have restricted the driving of the careless or irresponsible motorist.

Moreover, a Bureau of Highway Planning Studies was recently created within the Highway Department to instigate plans for correcting potentially hazardous conditions brought to light by scientific traffic studies. And outside the jurisdiction of the Department, a Highway Safety Commission was set up as an independent state agency to educate the driver and the pedestrian in highway safety measures. Finally, a small executive body known as the State Traffic Commission was established to coordinate controls on highway travels, to regulate and standardize signs, traffic lights, and speed restrictions.

Yes, John Doe, the motorist, is well protected.

Reducing Departmental Accidents

But shortly after assuming the position of Highway Commissioner, Dr. G. Albert Hill realized that there was one missing link in the combined highway safety programs. In fact, the link that was missing was in his own Department. The men who build and maintain the highways were not being protected.

Naturally, with close budgetary controls and increased construction and maintenance costs, the main problem was whether or not the Highway Department could afford a safety program. The accident record of the Department was not high compared to that of many other states. But a preliminary study of the dollars and cents annually paid out for workmen's compensation and public liability and property damage revealed that the Department could not afford to be without an effective safety program. The Commissioner accordingly established the position of Safety Engineer within the Department. The incumbent was to work directly under the Commissioner, and was responsible only to him.

Following the selection of the Safety Engineer, the eight bureau heads of the Department were called into the Commissioner's office, and were briefed concerning the purpose of the Division of Safety. The objective was the reduction of accidents. The results expected were the saving of human lives, the lessening of human suffering, the reduction of financial losses, and the conservation of the real assets of the State. The Commissioner explained that the duties of the Safety Engineer were to recommend policies, establish programs, enlist cooperation and compliance, and generally oversee any and all functions of the Department from a safety angle. All eight bureaus of the Department were to be included in the program, without exception. In conclusion the Commissioner remarked: "I not only request the full cooperation of all eight bureau heads, but I shall expect this cooperation throughout the personnel of your bureaus."

Analysis of the Situation

With the policies and duties of the position defined, the first step for the Safety Engineer was to analyze the situation and to ferret out the major problems. This was not difficult. Departmental records revealed the following facts:

1. The average annual number of compensation accidents occurring to departmental personnel was approximately 100. Those listed as reportable were accidents resulting in expenditures for medical treatment, or loss of pay-time from work. In this number of reportable accidents, there were four deaths and one permanent injury. Lost time charged for these five accidents alone amounted to 30,000 days. Approximately 3,000 additional days were actually lost because of minor injuries. The frequency rate of accidents was approximately 74.0.

2. The average annual number of claims for property damage or public liability, most of which involved truck accidents, was approximately 350. Those listed were only the accidents which involved an expenditure of $25 or more. In many cases, where damage occurred only to departmental equipment, no accident reports were submitted. Mileage records of individual trucks had been well kept. The mileage records of individual drivers had been kept only sporadically. In very few cases were there records of the dollars and cents spent on repairs due to accidents to any truck. The costs had been absorbed into reoccurring maintenance repair costs.

3. The payrolls of the Department

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Conn. Highway Dept. Steps Out for Safety

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showed approximately 3,000 individuals employed in over 100 diverse types of work and job classifications, including: laborers, maintainers, truck drivers, equipment operators, mechanics, machinists, carpenters, painters, plumbers, electricians, draw and lift-bridge operators, ferry-boat captains, watchmen, flagmen, tree climbers, nursery-stock planters, divers, riggers, structural-steel erectors, masons, laboratory technicians, chemists, storekeepers, surveyors, inspectors, foremen, and engineers.

4. The organizational chart of the Department showed eight bureaus, as follows: Business Administration, Engineering and Construction, Roadway Maintenance, Roadside Development, Town Aid, Boundaries and Right-of-Ways, Materials Engineering, and Planning Studies. Each bureau has its own specific duties and its own organizational set-up. The geographical limits of divisions within each bureau are not the same. Except for high-ranking employees, very few members of one bureau came into contact with those in other bureaus.

5. The books showed that there were 411 buildings occupied by the Department. Some of these were State-owned; others were leased. Many of these buildings, especially those leased, appeared to be sub-standard. They were used for a variety of purposes: storage garages, repair garages, machine shops, carpenter shops, electrical shops, experimental shops, paint shops, chemical laboratory, soils laboratory, physical testing laboratory, supply storage, dynamite storage, and offices.

6. The motor-vehicle records showed approximately 700 trucks and 200 passenger cars owned and in use by the Department. These vehicles were of diverse manufacture, model, and age. Because of the unavailability of replacements during and immediately following the recent war, much of this equipment had long passed its maximum efficiency. In certain cases, best safety measures would exclude the use of some of it. A partial list of the various types of specially equipped trucks included: dump, platform, eductor, tower, winch, fencing, sign, line-marking, bridge-maintenance, testing, tree-spraying, oil-spray, snow-plow, deicing, and survey trucks. In addition, it was found that at times the Department rented other trucks for peak loads or specific purposes; there existed no control over the condition or safety of these trucks.

7. The list of major types of movable equipment owned by the Department included: power shovels, power cranes, ditch hoes, bulldozers, tractors, graders, road rollers, pile drivers, core drills, well drills, compressors, power mowers, belt and bucket conveyors, and snow loaders.

8. The statistics of the Contract Section of the Department showed that during the eight or nine months of the construction season approximately 100 projects were under construction for the Department by outside contractors. A fair assumption would be that approximately 60 contractors were handling these projects. The statistics from the Town Aid Bureau showed approximately another 100 projects under construction by town forces, under departmental jurisdiction.

9. There existed no such thing as a standard safety code or safe-practice manual in any of the eight bureaus. Over a period of years, various officials had issued various looseleaf memoranda pertaining to safety matters. Many of these had been lost, outmoded, or not enforced.

10. Accident-prevention training, as such, had never existed except for the scattered individual activity of a few foremen. An attempt had been made at one time, by a private insurer, to hold meetings with the various field groups. But the insurer had one individual who attempted, on a part-time basis, to cover the field. And to make matters worse, the attempt did not receive the cooperation of the management. On another occasion first-aid training of field crews was attempted. The whole-hearted backing of management was again lacking, and the instructor did not have a high enough rank in the Department to gain cooperation. The first-aid training itself was excellent. However, the part that first-aid training plays, at best, is only about 5 per cent of the work of a well conceived accident-prevention program.

11. A partial survey of departmental personnel showed the normal reaction towards the establishment of an accident-prevention program—the reaction one might expect to find in the personnel of any large organization, factory or department, public or private, towards the introduction of something to which they are unaccustomed.

Statement of the Problem

There are four major steps in solving any accident-prevention problem: (1) locating the place where accidents occur; (2) determining when accidents occur; (3) investigating why they occur; and (4) finding a practical way to prevent their recurrence. In other words, the formula is: Where—When—Why—What.

It is quite easy to determine by adequate accident records where and when accidents are liable to occur. Nor are their underlying causes very difficult to establish for a well trained, experienced, safety engineer using interrogation, inspection, and investigation. For accidents do not *happen;* they are *caused* by an unsafe act, an unsafe condition, or a combination of both.

What should be done to prevent their recurrence is often a puzzle, since the solution is technical, operational, or educational in nature. Nevertheless, the safety engineer can usually solve that too by means of his knowledge, his research activities, or his outside contacts.

With the where, when, why, and what

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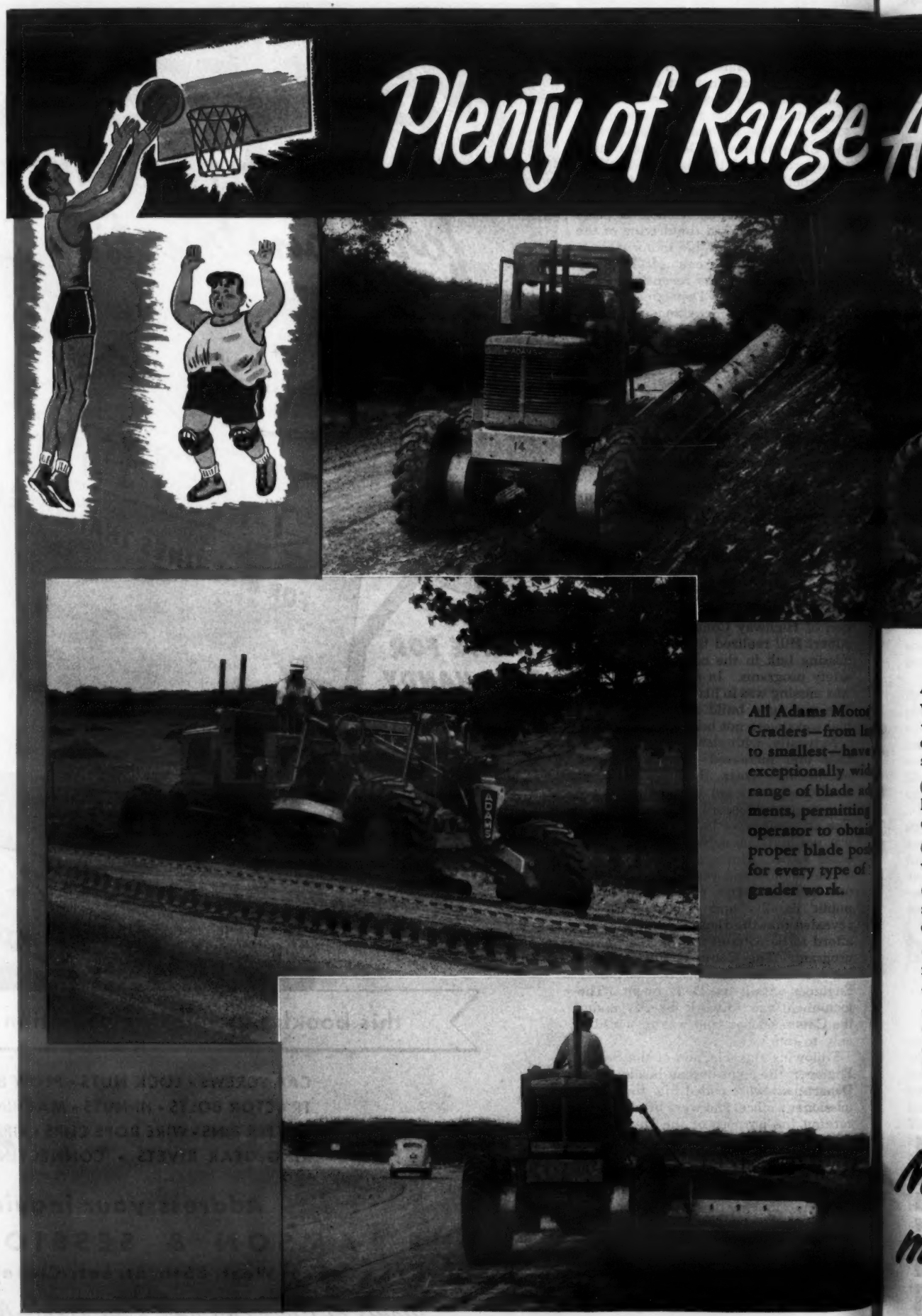

solved, the most difficult problem, then, is to obtain compliance with the corrective recommendations—actually doing what should be done. There is where most accident-prevention programs fail. In golf terminology it would be referred to as the failure to follow through on the swing.

Difficulties in Obtaining Compliance

The course traveled to obtain compliance is studded with obstacles. Though it matters little what the industry or type of work may be, there are often additional obstacles in public departments which are not found in private enterprises. These may be attributed to civil-service rules, governmental procedure, public financing, increased employee inertia, and the legal restrictions prohibiting the payment of incentives.

The elimination of an unsafe condition often requires a physical correction, which may involve (1) construction of new plants, (2) additions or alterations to existing plants, (3) changes in layout of equipment, (4) purchase of new equipment, (5) redesign or alteration of existing equipment, (6) design and installation of mechanical safeguards, and (7) purchase of safety clothing and first-aid supplies.

Purchases, alterations, and construction activities all require finances; finances involve budgetary controls; these controls require specified bureaucratic procedure with numerous approvals and authorizations. Open competitive bidding is required in most cases pertaining to purchases or construction; therefore, plans, specifications, and contractual documents are needed. Funds to cover the financing may not be set up in the bureau or departmental budget, and a transfer of funds from other activities is not always an easy matter. With so many steps to be taken, and so much processing to be done, it is easy to see why recommended corrections become pigeonholed or stymied. Safety-requirement requisitions are unusual and infrequent in most state highway departments; therefore, methods of processing these requisitions through the several bureaus have not become automatic and efficient.

But there is more than that to securing compliance. Elimination of an unsafe act usually requires a mental readjustment in the mind of each employee. He must want to do his work in a safe manner; he must know how to do the work in a safe manner; and he must actually do the work in a safe manner.

The law of self-preservation is instinctive; therefore, an employee wishes to do his work in a safe manner. The knowledge of how to perform the work in a safe manner comes from experience and proper training. Experience is perhaps the best teacher, but it is also the most costly one. On the other hand, training mature individuals to use the safe method is often a difficult problem, calling for organizational ability and salesmanship on the part of the safety engineer. In fact, this problem is never fully solved, for it is ever-recurring, with changes in personnel and operational technique.

Safety education may include any number of approaches, most of which must be hand-tailored to fit the circumstances. A few of the common methods are as follows: in-service training, first-aid training, plant and equipment inspection, field and plant-operation inspection, driver training, accident investigation and placement of accident responsibility, pre-job analysis, adoption of a safe-practice manual, physical examinations, corrective measures, and, above all, cooperation and a friendly spirit

Assuming we all desire to perform work in the safe manner, and have learned how, one would presume it would not be difficult to perform the job the safe way. But this is not always the case. At this point we might ask: "Why do we cross the street without first looking both ways?" The majority of us follow the crowd. We tip our hats to the ladies and we do not push the other pedestrian off the sidewalk. Yet it is strange that the attitude of so many people changes behind a steering wheel. There is an appalling lack of responsibility on the part of individuals, not only for their own safety but that of others, regardless of whether the individual is driving, working, or playing.

An outstanding authority on accident prevention recently remarked that our safety training begins too late in life; that it should be started at the age of four. Perhaps this accounts for the difficulties encountered in attempting to readjust mature minds, which are often set in their ways. Obtaining personal compliance—or the actual carrying out of an act the safe way—is the most difficult problem the safety engineer faces.

Just what is the mental or emotional reaction of a group of employees towards the introduction of an accident-prevention program? The majority would express themselves as favoring such a program. In actuality, however, very few of them want to be bothered or inconvenienced to the extent of carrying any of the responsibility. Neither do they wish to have their routines disturbed or interfered with. This is a natural, human reaction. Although this initial attitude does not aid the safety engineer, it should not be allowed to upset him. The average individual will carry his load in the safety program when he is convinced of its benefits. He will be enthusiastic when he, or someone close to him, has received some benefit from the program, or has had the misfortune of a severe accident. People are never so safety-conscious as immediately following an accident.

After personally establishing and handling three accident-prevention programs—one in industry, one in construction, and one in a public department—the writer has come to certain general conclusions about a group's initial reaction to the installation of an accident-prevention program.

Five per cent may be classified as over-enthusiastic. They are the youthful, the ball-of-fire, or theoretical-

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minded, who must be check-reined. Their eagerness should not be allowed to exceed economic practicability.

Fifteen per cent may be classified as enthusiastic. They have been practicing safety and have a progressive attitude. Usually they wish to improve working conditions. Perhaps they have been restricted, and this program gives them the needed outlet. They may be the civic-minded brotherly-love type. These will be the initial wheel-horses in any safety program. Without them the program would fail.

Sixty per cent may be classified as the "show-me" type, which is a mixture of liberals and conservatives. The advantages have to be clearly demonstrated to them, either by education, example, or experience. They must be converted to insure the success of the program. One by one they will voluntarily jump on board.

Another 15 per cent may be classified as the "do-nothings". This group is old in spirit but not necessarily in age. The individuals in it are non-progressive; they have reached their level of satisfaction in life, and they do not like changing conditions. On the other hand, they are too indifferent to buck the program. Even if they are converted, these people—because of their inertia—will accomplish little.

The remaining 5 per cent may be classified as "obstructionists". These people are the "don't-tread-on-me" or the "stay-in-your-own-yard; this is my-pasture" type. They are usually independent, and perhaps a bit boastful. They fear, sometimes with justification, that the safety engineer may uncover something against them. They must be handled with care. In a few instances departmental pressure may have to be invoked, but in most cases diplomatic, slow handling will change their attitude. As a result, they will become aggressive safety exponents.

These percentages are based on the normal curve of human-nature responses. The percentages will not vary to any appreciable amount, regardless of the classification of the industry or the type of work. A strange fact is that these percentages hold up and down the scale of authority. For example, the 5 per cent of obstructionists will be found at the level of supervisors, foremen, sub-foremen, or common labor. The higher the level, the greater the diplomacy the safety engineer must exercise.

Plan of Organization

With the major basic problems recognized, Connecticut's next step was to determine the best organizational set-up to solve them. For economic reasons it was necessary for the safety-program personnel to be kept to a minimum.

As part of its accident-prevention program, Connecticut protects its employees by a guardrail when they are working on the side of de-icing trucks.

The eight bureaus of the Department were functioning satisfactorily in all respects excepting safety matters. The Commissioner and Safety Engineer agreed that the work could best be handled by a Division of Safety. Its personnel would be independent of any bureau, and would act as expediters and advisory consultants cooperating with all bureaus. Direct enforcement of safety regulations was delegated to each bureau head. This arrangement eliminated duplication of authority over personnel, purchases, and expenditures.

The Division of Safety eventually will be comprised of the Safety Engineer, four assistants, and one clerk. The four assistants will be assigned to field operations, plant and equipment operations, engineering and outside construction operations, and office and statistical records and information. At present, the Division is operating with three employees, but as fast as personnel can be properly trained and integrated in the program, the work will be expand-

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ed. To date, safety work has been promulgated in plant operations and in field operations, both involving departmental personnel. Very little attention has been given to the operation of field equipment, trucks, and passenger cars. It is expected that another assistant will soon be added to the Division, to cope with the unsatisfactory conditions recognized in that phase of operations. It is anticipated that the roster of personnel will be completed early in 1950 by the addition of the fourth assistant and a clerk. At that time (which will be after the program pertaining to departmental employees has been well organized) outside contractors who are working for the Department will be required to toe the mark on safety matters.

Success of the Program to Date

Does the program work? In any ball game, the final score is what counts. The records to date show that the field forces have reduced the frequency of lost-time accidents by 50 per cent within the seven-month period since the safety program was adopted. The monthly record for each bureau has shown an improvement over the preceding month. Although we have not yet shifted from first to second gear, we already know that our accident-prevention program is more than paying for itself. With the continuation of the splendid cooperation already experienced, and the addition of further enthusiasm and cooperation from personnel in bureaus yet to be activated into the program, it is reasonable to expect even better records to be established.

The Department believes the taxpaying motorist is entitled to assurance that his money is going into highways, not into hospitals or mortuary parlors. The policy in Connecticut no longer permits the risking of human lives and public funds.

Powder-Driven Unit For Fastening Work

Two models of Ramset tools for fastening work are now being produced by the Stemco Corp., 3130 W. 121st St., Cleveland, Ohio. By means of a powder-actuated charge, Ramset fasteners are rammed into steel, wood, concrete, and other materials.

The models differ in size and capacity. The light-duty model, weighing 5 pounds, has a length of 10 inches and will fasten pins and studs up to 3¾ inches long. The heavy-duty model, weighing 10 pounds, has a length of 18 inches and will fasten pins and studs up to 6 inches long.

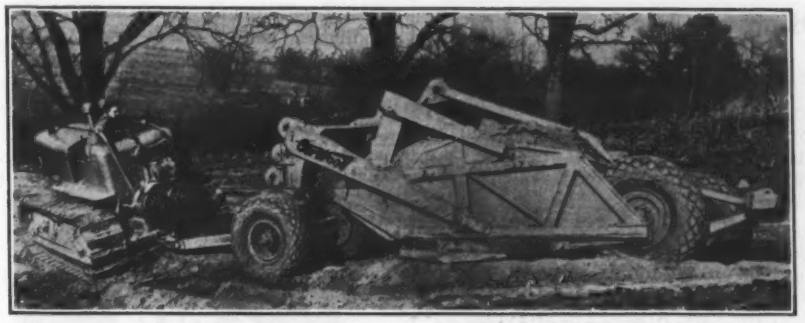
Powder charges are made in three strengths for each tool—light, medium, and heavy—all instantly identified by color. Pins, studs, and fasteners are available in a wide assortment, in various lengths, and with external or internal threading where needed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 91.

Four-Wheel Scrapers

Production is now under way on the newly improved line of Gar Wood 4-wheel scrapers for Allis-Chalmers industrial tractors. These scrapers are manufactured by Gar Wood Industries, Inc., Findlay Division, Findlay, Ohio. There are five models ranging in size from the Model 508, of 7.6-cubic-yard capacity, to the largest scraper, Model 528, with 28-cubic-yard capacity. Digging and loading are positive with a heavy-duty cutting edge and extension cutting edge. For greater economy, both edges are reversible and replaceable.

Large apron openings are designed for easy loading and ejecting of the loads. Heavy-duty outside apron arms close and open the apron with minimum loss of power from the control unit. The draft point is located aft of the cutting edge; this contributes to easy loading. All scrapers are operated by a ½-inch cable with straight-line cable reeving.



Five new models of Gar Wood 4-wheel scrapers are now available for use with Allis-Chalmers tractors. They range in capacity from 7.6 to 28 cubic yards.

The scrapers feature: positive roll-out ejection, provided by the rear apron moving up and forward in one operation; large tires to allow ample flotation and stability of the unit; short turning radius; and an engineered weight distribution.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

Lion Promotes Two Men

Lion Oil Co., El Dorado, Ark., recently announced that J. H. Sheehan has been appointed to the newly created post of Sales Manager of all petroleum sales, and that Leroy Donald will assume the position of Administrative Assistant (Chemical Sales) to the Vice President.

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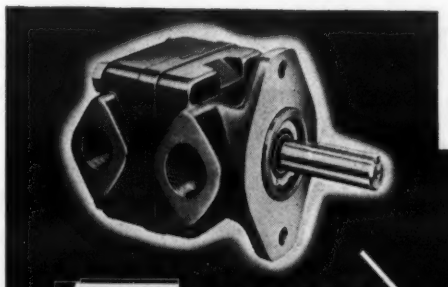

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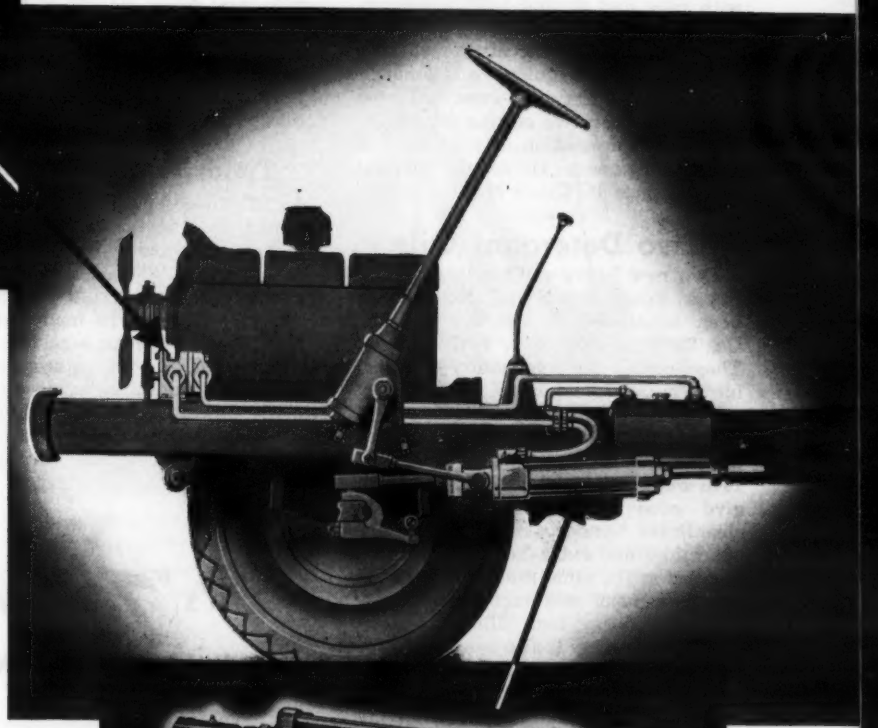
See Bulletin 49-52



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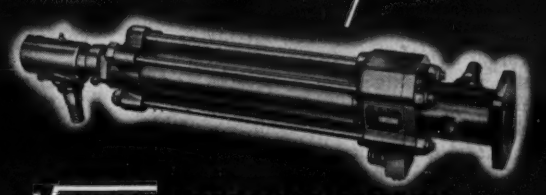

VICKERS HYDRAULIC STEERING BOOSTER with integral overload relief valve . . . See Bulletin 47-30a

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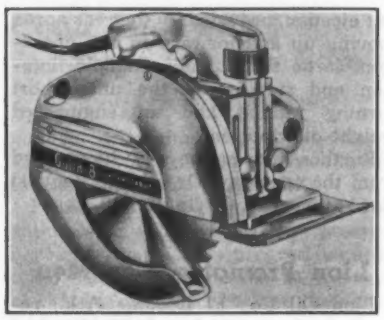

The new Model A-8 Guild saw is designed for general construction work, heavy-duty cross-cutting and ripping, maintenance work, and general carpentry requirements.

General 8-Inch Saw

A new 8-inch Guild saw has been added to the line manufactured by the Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y. The Model A-8 weighs 13½ pounds and is designed for general construction work, heavy-duty cross-cutting and ripping, maintenance work, etc.

A tilt attachment is available for adjustment to angles from 45 to 90 degrees. Abrasive cutting wheels may also be secured for work with tile, metal, etc. Maximum depth of cut is 2⅞ inches. The 8-inch blade has a ⅝-inch standard round hole and is fully guarded. The motor is equipped with a turbine fan which draws air through the motor and discharges it at the front, keeping dust off the work.

Standard equipment includes a combination blade for ripping and cross-cutting, a 10-foot three-conductor cord with plug and ground lead, a wrench, and a tube of grease. Optional equipment includes the tilt attachment, rip guide, cross-cut guide, a Hammertone metal carrying case, selected blades, and abrasive cutting wheels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 31.

Two Detergent Oils

Two new heavy-duty detergent oils, Super Tenol and Tenol Extra, have been announced by Sinclair Refining Co., 630 Fifth Ave., New York 20, N. Y. They extend the application of Tenol into a broader field where heavier-duty service is encountered.

Super Tenol meets engine test requirements of Army Specification 2-104b Supplemental List I. It is said to give good performance and engine cleanliness under high-temperature operations and extra-heavy-duty service, and at the same time to thwart the development of cold engine sludge under conditions of long idling and stop-and-go operation. It also combats problems presented through the use of improper or high-sulphur fuels.

Tenol Extra qualifies under Army Specification 2-104b Supplemental List II; it also meets Caterpillar's requirements for Series 2 oils for use in supercharged engines and under conditions of abnormal heavy-duty service and where high-sulphur fuels are used.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 73.

Highway Work Thus Far Slightly Less Than in 1948

Highway construction contracts costing approximately $647,485,000 were let by state highway departments during the first seven months of this year, the Bureau of Public Roads reports. The projects involved work on 25,828 miles of road. These figures are slightly lower than the $684,560,000 worth of construction on 26,470 miles of roadway for which contracts were awarded between January 1 and August 1 of last year.

Contract awards in July of this year totaled $123,151,000 for improvements on 4,376 miles of highway. Last year the total for July was $116,469,000 for 4,756 miles of road work.

Projects financed partially or entirely with Federal funds accounted for $389,504,000 of the total cost of road work contracted for during the first seven months of 1949. The Federal contribution amounted to $208,578,000. The contract cost of projects financed without Federal Aid was $257,981,000.

Pennsylvania, with a total of $69,236,000, led the states in the dollar-volume of contracts let in the seven-month period. New York was second with a total of $60,751,000, Texas was third with a total of $57,405,000, and California fourth with a total of $38,136,000.

In total mileage of road improvements contracted for Texas was first with 3,688 miles; Ohio second, with 2,305 miles; Kentucky third, with 2,044 miles; Kansas fourth, with 1,251 miles, and Pennsylvania fifth, with 1,129 miles.

Federal-Aid projects completed during the first seven months of this year consisted of improvements on 6,815 miles in the Federal-Aid primary and secondary road systems at a total cost of $279,477,000. Of this $140,209,000 was Federal funds.

Field Servicing Unit

A bulletin describing its new truck-mounted field service unit, type PW-308, has been issued by the Davey Compressor Co., N. Water St., Kent, Ohio. This catalog sheet describes the features of the unit and lists its many types of service for construction machinery.

Some of the service equipment carried by the trucks are: welding generator, ac power generator, compressor, lubrication equipment, tire-service equipment, oxyacetylene cutting and brazing equipment, machinist's tools, floodlights, and a 7,500-pound front winch. A diagrammatic floor plan shows the location of this and other supplementary equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 155.

J. N. Dodds, Engineer, Dies

John Nelson Dodds, 42, Service Engineer for the Cleveland Trencher Co., died in Cleveland after a long illness. Mr. Dodds had been with the company for nine years and was widely known in the construction field.

LOOK*
NO HANDS
*Joe gets a smooth ride since they equipped his tractor with Velvetouch All-Metal clutch facings and brake linings
Smooth, positive performance. And longer service life, too. That's what you get with Velvetouch. Because Velvetouch is all-metal! It runs cooler to insure absolute operating uniformity . . . can't deteriorate like ordinary asbestos . . . and it won't rot in oil. Velvetouch costs less . . . when measured in terms of extra hours on the job! Specify genuine Velvetouch on your next replacement order, for only Velvetouch gives you all the plus advantages of all-metal construction.
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FOR BRAKE AND CLUTCH USE
VELVETOUCH
ORIGINAL EQUIPMENT
. . . WITH THE LEADERS

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with DC-6 CONTROL
DIRECT CAB
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CUBIC YDS.
FOR SEAL-COATING . . . ICE AND SLEET CONTROL
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WIDTH OF SPREAD:
FROM 12 TO 28 FT. FOR SEAL-COATING.
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DC-6 CONTROL - - - - - - - - -
Ignition, Starter, Flasher Lights, Clutch, Choke, and Throttle are fingertip controlled from the truck cab. Fits any truck.
STEEL BELT CONVEYOR - - - - -
The controlled intermittent action shakes materials down through the wide throat onto the twin spinner discs.
UMBRELLA SPREAD - - - - - - -
Material is confined to a low horizontal plane thereby protecting traffic.
WATERPROOF, AIR-COOLED MOTOR - -
A powerful unit capable of driving the twin spinners at a speed of 2400 r.p.m.'s.
SPREADS ANY MATERIAL:
SAND
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ANY OTHER DESIRED
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GOOD ROADS MACHINERY CORP. - - - - - - - - - - MINERVA, OHIO

¾ TON WINCH
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ROPE
This Hand Winch is ideal for moving and installing heavy machinery, loading trucks, hand derricks, cranes, gin poles, loading logs, sawed lumber, loading implements on trailers, hoisting silage, pulling wells, etc. Can be bolted anywhere and operated in any position. Made of electric steel; bronze bushed; 2 speeds, 8 16 to 1 for heavy loads.. 3 to 1 for fast operation ... self locking to hold loads at any position.
Overall Dimensions 12⅛ in. x 7½ in. x 7 in. Handle 10 in long. Drum size 3 in. dia. x 6 in. long x 6 in. dia. flanges. Will hold 100 ft. ¼ in. Wire Rope. Illustrated with 50 ft. ¼ in. Wire Rope. Shipping Wt. 37½ lbs. GUARANTEE —Five-day return privilege.
$39.50 WITH 50 FT. of ¼ in. WIRE ROPE
Send remittance with order and we prepay postage.
GOLD FOUNDRY & MACHINE WORKS
1618 S. Osage St., Dept. CE, Independence, Mo.

Maneuverability in small areas is the feature of the Concrete-Truk.

Small Mobile Truck To Handle Concrete

A mobile concrete-handling truck, maneuverable in small working areas, is now being offered by the Monroe Sales Corp., 333 Midland Ave., Detroit 3, Mich. Compact dimensions, 42 x 83 inches overall, allow the Concrete-Truk to be raised or lowered in a 7-foot construction tower. Steered by a single tail wheel, it is designed to turn around in its own length.

This materials-handling device has three speeds forward, up to 15 mph, and one reverse, up to 7 mph. The all-welded steel box will carry 14 cubic yards of concrete or any 3,000-pound load. Powered by a Wisconsin AEH engine with battery self-starter, the truck features a flat operator's deck for easy operation, quick cleaning, and safety.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 87.

Improved Regulator For Air Compressor

An improved regulator for its portable compressors has been announced by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. This new UL-83 Floating-Speed regulator is simpler in operation and easier to adjust than the original Multi-Speed regulator.

Whenever less than the full capacity of the compressor is used, the regulator slows down the operation to the lowest practical working speed that will compress just enough air to hold the pressure. The regulator automatically varies the speed by adjusting the engine governor spring. When the air demand changes, the speed varies accordingly. The compressor capacity is said to be varied throughout the entire speed range without stepping or cycling.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 24.

Scraper Designed For Large Tractors

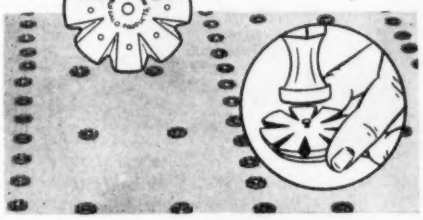
A new Model C-314 tractor-drawn scraper has been announced by LaPlant-Choate Co., Inc., of Cedar Rapids, Iowa, to replace the C-114 model. The C-314 has a capacity of 14 cubic yards struck and 17.5 heaped, and is designed for use with large tractors. It can be equipped with a combination of different tire sizes starting with 18:00 x 24's up to and including 21:00 x 29's.

Designed for use with large tractors, the Model C-314 LaPlant-Choate scraper replaces the C-114 model. It has a struck capacity of 14 cubic yards, 17.5 heaped.

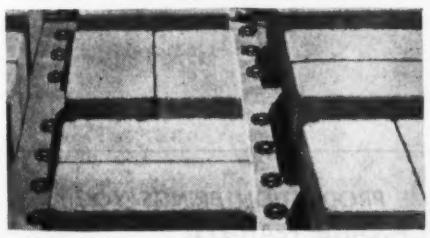
A feature of this unit is its interchangeability with the scraper unit S-300 of the TS-300 motor scraper. By changing the main frame and tires, if necessary, and adding rear-wheel brakes, the unit can be hooked directly to the T-300 tractor to make a high-speed self-propelled unit. Conversely, the scraper unit now used with the TS-300 can be converted to use with track-type tractors when extreme operating conditions make it necessary.

Further information on the Model C-314 scraper may be secured from the company. Or use the Request Card at page 16. Circle No. 117.

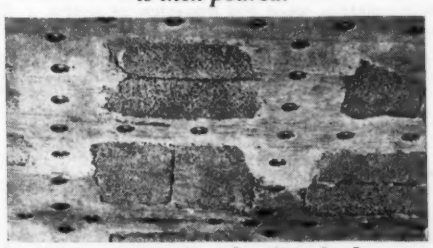
"KiFS are Economical, Easy, and Plaster *will stay in place*"



Nail Kifs six inches apart on forms when concrete is to be poured.



If blocks are used, they are placed between the rows of Kifs. Concrete is then poured.



After concrete has hardened, the removal of forms pulls the elastic Kifs out of concrete, leaving clean, undercut niches.

★ ★ ★

Steps shown at the left were photographed at St. Joseph's Collegiate Institute, Buffalo, N.Y. Siegfried Construction Co., Inc., General Contractor; Seitz & Madden, Plasterers; O'Connor & Delaney and Duane Lyman & Associates, Architects. On this job, 40,000 square feet of ceilings and beams were Kiffed.

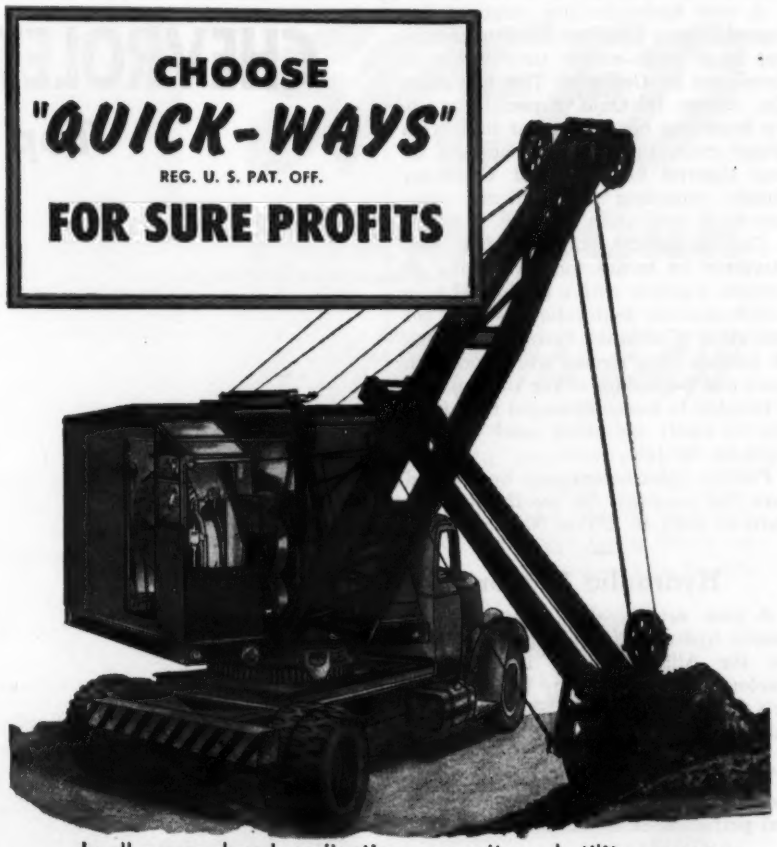
★ ★ ★

Seigfried Construction Co., Inc. says: "The results of using Kifs for direct plastering on concrete have been so favorable, we will use them wherever possible. Kifs are easy and economical to use and a sure way to know that the plaster will *stay in place.*"

Kifs can be rented or purchased. For full information on this new, fast, low cost method of bonding plaster permanently to concrete, write us now.

BUFFALO PRODUCTS, *Inc.*
A subsidiary of Frontier Industries, Inc.
319 BABCOCK ST., BUFFALO 10, N. Y.

CHOOSE "QUICK-WAYS" REG. U. S. PAT. OFF. FOR SURE PROFITS



In all power shovel applications, capacity and utility are essentials. A truck shovel must have high speed mobility, be immediately convertible, and have adequate capacity to be economical on every job. A *"QUICK-WAY"* has all these fundamentals plus a long list of others.

"QUICK-WAYS" are designed for full truck speed, on or off the highway. Mounted on any standard truck, the working parts provide perfect operating balance for the truck shovel. All-steel construction gives built-in strength and lightness for maximum capacity and stability.

You get more utility out of a *"QUICK-WAY"* fully equipped, than any comparable equipment. Each *"QUICK-WAY"* is easily converted in minutes from Shovel to Crane, Dragline, Clamshell, Pile Drive, Scoop, Trench Hoe, Backfiller, etc. Buy only the attachments you want; your *"QUICK-WAY"* does more jobs better.

Parts are rugged and simple, requiring a minimum of servicing and having proved ability to take a life long beating. Many interchangeable parts and easy accessibility simplify maintenance and repair. From engine to attachment, every *"QUICK-WAY"* part will deliver its capacity rating and more.

The essentials built into every *"QUICK-WAY"* mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a *"QUICK-WAY"* owner near you; ask HIM.

MODEL E: 4/10 cu. yd. capacity, mounts on any standard 5-ton truck.
MODEL J: 1/4 cu. yd. capacity, mounts on any standard 1½-ton truck.

"QUICK-WAY" TRUCK SHOVEL COMPANY
DENVER, COLORADO
Worldwide Distributor Sales and Service
PIONEER IN POWER SHOVELS FOR TRUCK MOUNTING AND STILL THE LEADER

A worker uses the new hydraulic tire remover developed by Goodyear Tire & Rubber Co. It is designed for loosening beads of giant earth-mover tires so that they may be removed from rims while on the job.

Tire Remover Made For Heavy Equipment

A new hydraulic tire remover designed to save time and labor in changing large earth-mover tires has been developed by Goodyear Tire & Rubber Co., Akron 16, Ohio. Especially made for loosening beads of giant tires from wheel rims, the tool will operate on any tapered bead rim of Goodyear design, according to the firm's engineers.

The equipment consists of a ram assembly 19 inches long, weighing 25 pounds, together with a pump and hose which provide hydraulic pressure for operating. The latter two pieces weigh 16 pounds. The device works on both front and back sides of the rim, making it possible to loosen damaged tires from the rim easily and effect quick changes right on the job.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 35.

Hydraulic Loader

A new catalog sheet featuring the Domor hydraulic loader, specially built for the Allis-Chalmers Road Patrol tractor has been issued by Ulrich Products Corp., of Roanoke, Ill. This loader handles a ½-cubic-yard load, lifting it to a 10-foot height.

This bulletin lists the installation procedure, operations, design, construction, and performance of the loader. Photographs of its component parts and of the unit mounted in place are also included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 126.

New Power Sprayer

A new power sprayer is manufactured by Jari Products, Inc., 2938 Pillsbury Ave. S., Minneapolis 8, Minn. It has two 73-degree-angle flat spray nozzles and one angle-swivel nozzle on the front boom. Spray widths are 2, 4, 7, 9, or 14 feet, depending upon the number of nozzles spraying. A hand sprayer nozzle, with 25 feet of hose, is designed to spray a pattern width from 4 to 6 feet. An interchangeable tip is furnished for tree spraying.

This sprayer unit is designed as an attachment for the Jari power scythe. The all-steel welded tank has a capacity of 10 gallons. The bronze ¼-inch gear-type pump, with Nylon seal, is driven directly from the mower drive shaft. A 40-mesh Monel screen strainer is used on the end of the suction line in the tank, and 100-mesh replaceable screens are used in each nozzle to prevent clogging.

Spray widths of the Jari power sprayer are 2, 4, 7, 9, or 14 feet, depending on the number of nozzles spraying. It serves as an attachment for the Jari power scythe.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 60.

RICE PORTABLE Self-Priming CENTRIFUGAL PUMPS

Latest Advances in Pump Engineering Set New Standards for Pump Efficiency and Performance

- The streamlined interior and elimination of sharp curves and angles in RICE Self-Priming Centrifugal Pumps assure top pumping efficiency. The Bellows-Type Cartridge Shaft Seal is one outstanding feature as are the others listed below. Send for illustrated Bulletin for details.

- Automatic Priming
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10M Model mounted on pneumatic-tired wheels. Steel Wheels and skids also available.

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Every RICE PUMP carries an A.G.C. Rating Plate.

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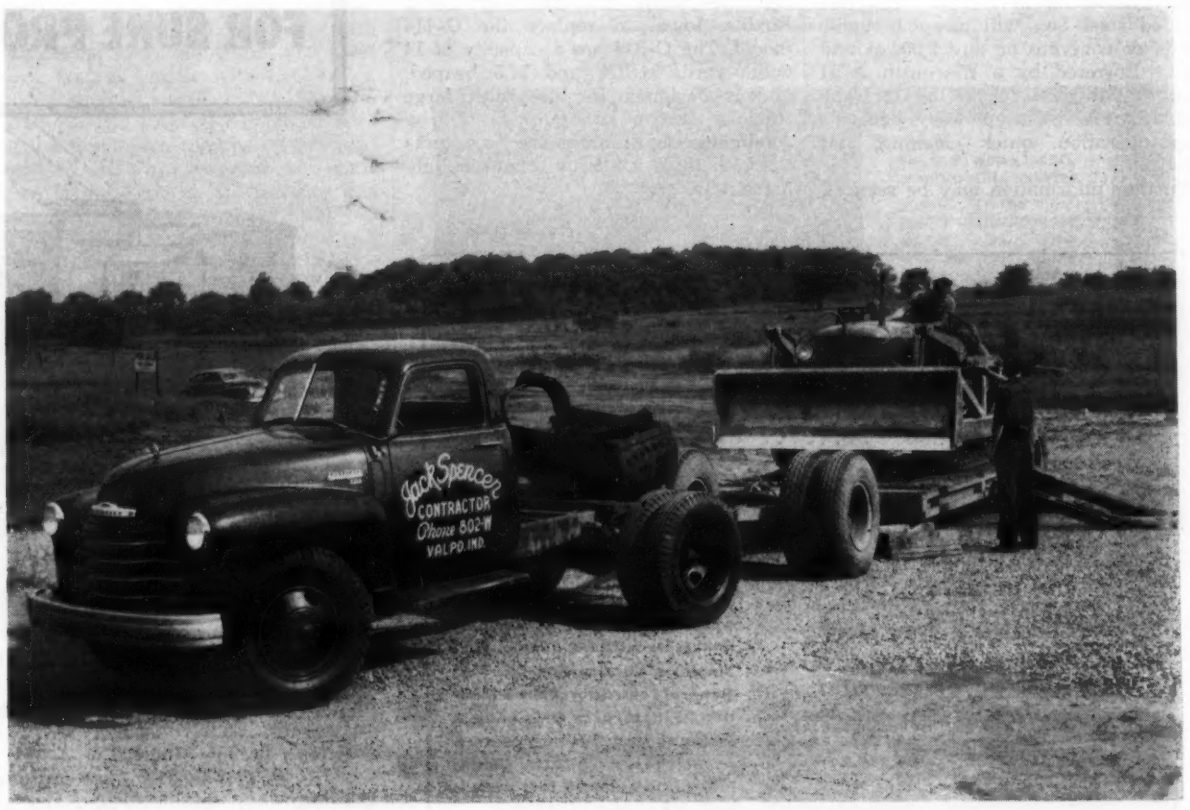
CHEVROLET ADVANCE-DESIGN TRUCKS

Top All the Rest for Value



CHEVROLET Chevrolet Advance-Design trucks offer you more of the features you want most. These easy-handling trucks rank tops for dependability, endurance, economy. They assure superior driver comfort, offer a wide variety of models, provide super-sturdy construction through and through. Chevrolet trucks alone give you the sensational advantages of 3-WAY THRIFT—lower cost operation, lower cost upkeep and the lowest list prices in the entire truck field. No wonder Chevrolet trucks are America's top choice for value . . . outsell the next two makes combined! For full information see your Chevrolet dealer—soon!

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TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated. Faster shifting maintains speed and momentum on grades. In Series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as their world-famous economy.

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

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**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

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New Deck Placed On River Bridge

39-Year-Old A.S.&B. Span Across Missouri River Gets New Concrete Slab To Carry 1949 Loads

By RAYMOND P. DAY,
Western Editor

+ BACK in 1910, when the Armour-Swift-Burlington bridge was built across the muddy Missouri River at Kansas City, Mo., engineeers considered it the last word in modernization. Today they consider it obsolete. For Kansas City has traffic problems today, and the city needs more than the old structure. Plans are already in the making for construction of another bridge, but the old A.S.&B. structure is also getting a first-class renovating.

M. E. Gillioz, a contractor from Monett, Mo., has some $1,048,627 worth of work on the bridge under a contract with the Missouri State Highway Department. His contract, scheduled for completion in November, 1949, calls for a general repair job. The big item of work is the demolition of the old asphalt-topped portland-cement-concrete deck, and the reconstruction with portland-cement concrete of the slabs.

While work is under way traffic must be accommodated. That is one of the contract provisions. It has complicated the field work, because men and equipment can concentrate usually on one or two traffic lanes at most. The others have to remain open to carry vehicles which crowd bumper to bumper. A traffic count made while the work was under way showed 1,725 vehicles per hour during the peak rush, according to the Resident Engineer's office.

First Built With Wood Floor

The A.S.&B. bridge was originally built with a wood plank deck. This was changed later on to concrete, and in 1927 the present center slab was constructed. The center slab carries two traffic lanes, and there are single traffic lanes on either side cantilevered from the main structure.

The bridge is 4,110 feet long, has 58 feet of roadway width overall, with a pedestrian sidewalk 4 feet 3 inches wide on the side of each handrail. Rock piers with steel pedestals support the bridge. They are 61 feet 10 inches on centers on land, and considerably farther apart in the water. Three river piers carry the load.

The lower deck carries the Burlington railroad. The center river section of the railroad consists of a vertical-lift span, which can be raised to clear the highest steamboats which use the Missouri River.

A severe fire in 1922 burned a freight house under the bridge to the ground. The intense heat twisted and warped some of the steel structural members. The Missouri State Highway Department earmarked a $100,000 fund for force-account work as directed, to repair these members. This work is also a part of the contract.

Approximately 6,149 cubic yards of new concrete are being placed in the new deck slabs, while about 6,000 cubic yards are being removed. There will be 1,021,000 pounds of welded bar mat and 138,000 pounds of bar steel reinforcing in the new work, and about 170,000 pounds of new structural steel to replace those members which were damaged beyond repair by fire.

Orderly Pattern of Work

G. F. Hare, General Superintendent for M. E. Gillioz, has laid the project out in an orderly pattern, designed to permit the best possible production with the least interference to traffic. The east traffic lane was rebuilt about 75 per cent of its length first of all, leaving the center and west slabs for traffic use. Next the west slab was rebuilt, with traffic routed over the east and center slabs. The center slab reconstruction followed, and after that was done the unfinished portion of the east lane was finished.

This sequence of work was necessary partly because plans called for an overlap in some of the slabs. Thus it was necessary to build the low ones first.

Gas Line Moved

One of the first items was the relocation and reconstruction of a 16-inch gas line carried underneath the bridge deck. This work was all done under a subcontract with Tetyak & Young, welding contractors of Kansas City. Most of it was finished before much of the prime contractor's work began.

Before the main construction opera-

(Continued on next page)

Check these advantages!

Compare the Features of the High Discharge Transport Truck Mixer:

Write for full details on this durable, efficient mixer.

- VISIBLE MIXING
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SPEED FORM WORK WITH AMERICAN SAW

Cut rough forming time—use this big power, big capacity AMERICAN Saw! Many times faster than hand sawing. Especially fast for concrete form work in heavy construction such as bridges, buildings and road work.

For example—workman using an American Saw can eliminate measuring and marking for many cuts, by using the saw's calibrated base for ripping. Power to spare for all-around work . . . G.E. motor develops 2⅛ H.P. . . . zips right through wood, stone, tile, sheet metal, compositions. Will cut a 2⅛" plank at 45°, or 3" straight cut. Holds accurate depth of cut and angle adjustment. No jolt—no twist when starting . . . balanced torque principle. Precision-built . . . sturdy for long life. Send coupon for details.

The American Floor Surfacing Machine Co.
558 So. St. Clair St., Toledo 3, Ohio

☐ Please send illustrated bulletin and price on new American Power Saw. No obligation.

☐ Please arrange a FREE demonstration of the new American Power Saw. No obligation.

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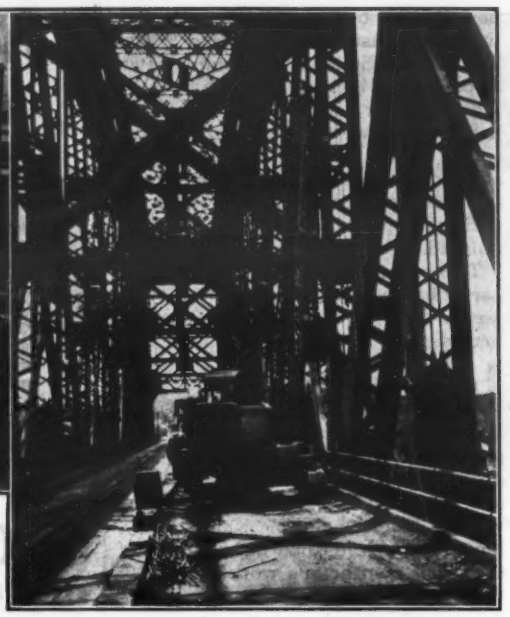
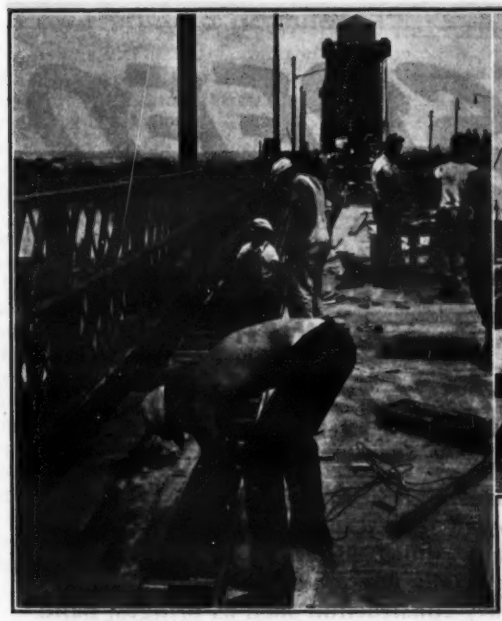


C. & E. M. Photos

Contractor Gilliox' first step in renovating the A. S. & B. bridge across the Missouri River at Kansas City, Mo., was to demolish the old asphalt-topped portland-cement-concrete deck. The RPB Junior pavement breaker shown above was selected for the job, and a Unit crane, shown at right, helped load the rubble to waiting trucks to be hauled away.



C. & E. M. Photos

Along each handrail of the bridge is a pedestrian sidewalk 4 feet 3 inches wide. The carpenters at left are setting forms for this walkway, while the photo above shows a Smith 4½-cubic-yard mixer mounted on a White truck placing deck concrete as the crew vibrates and finishes the mix. Notice the traffic on the other half of the bridge; it had to be maintained throughout the job.

New Deck Placed On River Bridge

(Continued from preceding page)

tions got under way, a timber scaffold suspended by ½-inch cable slings was built about 5 feet below the bridge deck. Designed to catch the broken pieces of concrete pavement from demolition work, it was required by the Army Corps of Engineers, which controls bridge clearances over navigable waters.

The timbers for the scaffold were 8 x 8 inches, with some 8 x 16-inch pieces. These were slung from the structural frame work underneath the deck, and then floored with 2-inch planks. This scheme not only prevented the broken concrete pavement from falling into the river, but it also gave workmen a place from which to work when they cut the old steel reinforcing bars loose.

Demolition of Deck

Breaking the old pavement was one of the interesting features of the project, because it posed peculiar problems for demolition equipment. Breaking 6 inches of pavement on a bridge deck is an operation considerably different from breaking the same pavement on solid ground.

An RPB Junior pavement breaker was selected for this work. The machine came mounted on a pneumatic self-propelled carriage, and was capable of swinging in an arc over its work. The pavement breaker was connected by flexible 1½-inch hose to a 265-cfm Gardner-Denver compressor, the source of its power.

Because of stresses set up in the framework of the rubber-mounted pavement-breaker carriage, some welding was done on the job to strengthen the A-frame gusset plates. After these minor alterations were made, the machine demolished as much as 3,600 square feet of 6-inch concrete pavement in an 8-hour shift.

The outside lanes were broken by

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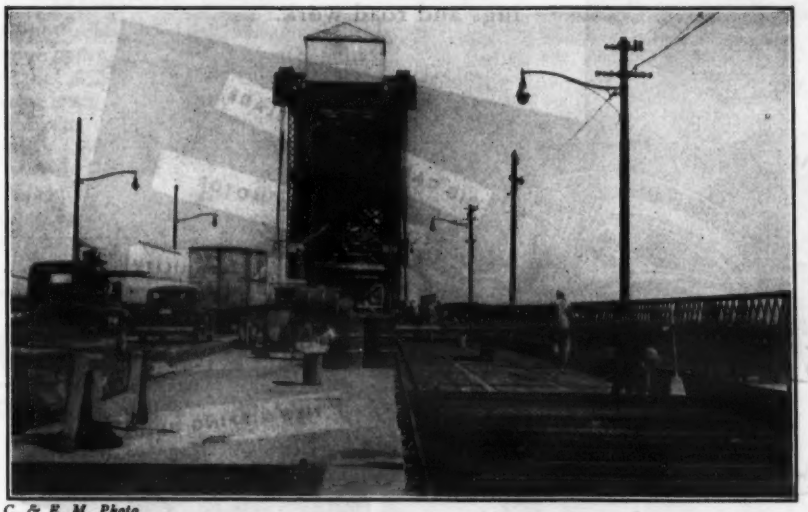
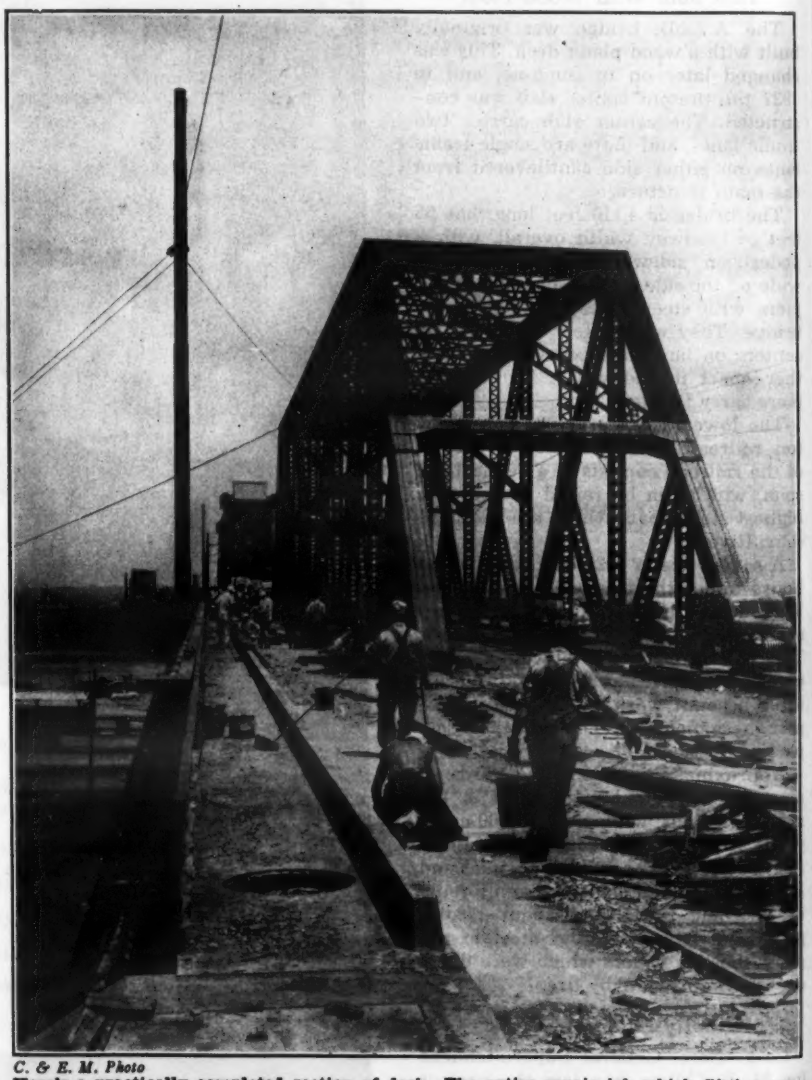


C. & E. M. Photo

About 80 per cent of the deck concrete was placed by the Pumperete system, as shown here, with the truck-mixers mixing the concrete and hauling it to the Rex machine.

C. & E. M. Photo

The new decks will have raised concrete rib traffic-lane markers cast monolithically with the slab. Several concrete finishers install them as the paving progresses.



C. & E. M. Photo

Here's a practically completed section of deck. The entire repair job which Gilliox contracted for $1,048,627 is scheduled for completion by November of this year.

first making a cut approximately 5 feet wide along the handrail. This demolished the pedestrian sidewalk, curb, and a narrow strip of pavement. A laborer who worked with the machine removed the curb angle iron as it was broken loose.

The machine then moved over to the opposite side of the lane and broke a narrow strip loose from that edge. The center section was then demolished, and the whole process repeated. Much of the concrete was fairly rotten, but some was remarkably sound after more than two decades of service.

Welders with cutting torches followed immediately behind the RPB pavement breaker. They cut the old reinforcing steel loose, so the labor crew could load it to salvage trucks. The broken concrete pieces were shoveled by hand into 1-yard steel cans, and the cans were then dumped to the beds of several trucks which hauled it away. A great deal of the broken concrete was used to make a fill for the Burlington railroad near the site. The remainder was wasted near the right abutment.

Concrete Work

When the A.S.&B. remodeling project was in the planning stage, engineers in the Missouri State Highway Department talked over and over about how the concrete might be handled. Some suggested it might be a truck-mix job; others said Pumpcrete was the only answer. Gillioz is using a combination of the two methods, placing about 80 per cent of the deck by the Pumpcrete system.

Deck form work consists of plywood facing, nailed to 2 x 6 joists. These joists are in turn suspended from the structural-steel bridge framework.

Concrete is being batched and mixed by Stewart Sand & Material Co. of Kansas City, commercial producer of concrete and other building materials. The standard Missouri Highway Department mix is being used, made with regular gray portland cement.

Twin mats of welded steel reinforcing are installed in each pour at least 150 feet ahead of the concrete-placing point. Where transit mixers can be used, the trucks back in to the proper spot and discharge their loads to the pour. Four Smith 4½-cubic-yard mixers on White trucks will handle about any pour on the bridge.

That concrete which is handled to its placing point by the Rex Pumpcrete machine is also hauled and mixed by the truck-mixers. The Pumpcrete machine is always set up as near to the pour as possible to minimize the pumping distance. An increase of 15 per cent in the cement content of the mix is the rule whenever the Pumpcrete method is used. This permits a slightly higher slump in placing, but still insures the proper strength.

Concrete after being deposited on the deck is spread approximately even with the screed lines by a labor crew. Then a Jackson vibratory screed, drawn by two husky workmen, puts on the preliminary mechanical finish. Two Jackson vibrators also work just ahead of the screed, consolidating the concrete around the steel reinforcement.

Cement finishers with long-handled wood floats work behind the Jackson vibratory screed, and the final finish is a combination of brooming and a pulled belt. Hunt Process Clear concrete-curing solution is being used to cure the pavement.

The new decks will have raised concrete rib traffic-lane markers, and these are being cast monolithically with the slab. Several cement finishers bring these along as the pavement progresses. When the crew in 6 hours placed 128 cubic yards, the foreman was well satisfied, because that is good production on a job where heavy traffic must be handled every minute by flagmen scattered over the project.

Personnel

The A.S.&B. renovation was worked out jointly by officials of the city of Kansas City, Mo., and the Missouri State Highway Department, under Carl W. Brown, Chief Engineer. James J. Corbett has general charge of supervision as Construction Engineer, and J. I. Stelzer is Resident Engineer.

For the contractor, G. F. Hare is General Superintendent, assisted by Marcel Moret, Harold George, and Carl Hagar.

Accidents don't just happen; they are caused. Remember—safety always pays.

Williams New Manager For Fulton Bag, Dallas

Fulton Bag & Cotton Mills, of Atlanta, Ga., has announced that George W. Williams is the new manager of its Dallas plant. Adolph Mayer, former Manager at Dallas and Director of the company, died recently. He had been associated with the company for over fifty years.

REX WINCHES *Save you* Time, Money, Labor

JUNIOR TRUCK WINCH
Weight 156 lbs. Ratio 32 to 1
Height 9" Lift 1000 lbs.
Length 26" Width 10"
Plate drilled to fit standard truck frame. Oil sealed bearings, stainless steel brake band. Spool capacity 400 ft. 5/16" cable. Winch runs from power take-off. Sizes 5 to 7½ ton capacity.

JUNIOR COMPOUND POWER WINCH
Weight 140 lbs. Ratio 96 to 1
Length 23½" Lift 1000 lbs.
Height 10½" Width 10"
Equipped with clutch and brake. Spool capacity 200 ft. ¼" cable. A portable machine. Use with ¼ or 1 H.P. Motor. 5 and 7½ ton size.

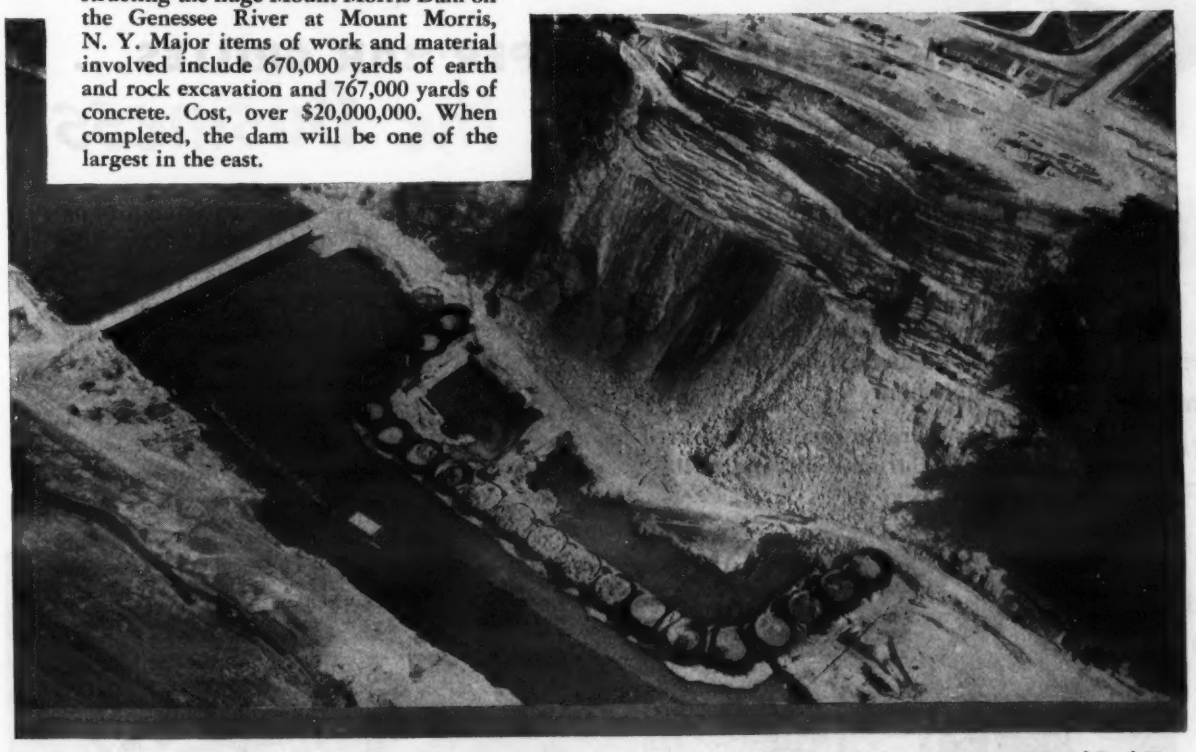
JUNIOR HAND OR POWER WINCH
Weight 60 lbs. Ratio 32 to 1
Length 13" Lift 1000 lbs.
Height 8" Width 8"
Spool cap. 100 ft. ¼" cable. All gears in oil. Has 3/16 key way for power drive.

JUNIOR POWER WINCH
Weight 76½ lbs. Ratio 32 to 1
Length 15⅞" Lift 1000 lbs.
Height 6¾" Width 8⅛"
Spool cap. 180 ft. ¼" cable. Oil sealed bearings. Write for complete Catalog.

REX MACHINE CO., 1152 Turner Ave., Grand Rapids, Mich.

GULF QUALITY LUBRICANTS and FUELS help keep equipment *on the job* at Mount Morris

Mount Morris Dam Builders, Inc., consisting of 5 leading contractors, is constructing the huge Mount Morris Dam on the Genessee River at Mount Morris, N. Y. Major items of work and material involved include 670,000 yards of earth and rock excavation and 767,000 yards of concrete. Cost, over $20,000,000. When completed, the dam will be one of the largest in the east.



Photograph through the courtesy of Fred H. Powers, Democrat-Chronicle, Rochester, N. Y.

The Mount Morris Dam is a big construction project. It's the kind of job on which the contractors are not likely to take chances with their equipment. They want sure protection and efficient power to insure top performance and prevent costly mechanical delays.

That's why Mount Morris Dam Builders, Inc. selected Gulf Quality Lubricants and Fuels—on the basis of experience and reputation. And they are getting the kind of lubrication and fuel performance that is required to complete the job on schedule.

Write, wire, or phone your nearest Gulf office today and arrange to use Gulf Quality Lubricants and Fuels on your next job. They are quickly available to you through 1200 warehouses in 30 states from Maine to New Mexico.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:
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GULF

For the Finest in Chain Saw Performance — Lombard Model 7 Two Man Saws with new Warren High Speed Chain

Dealer opportunities in some areas.

- Cuts easier because of governed chain
- Cuts faster result of unique plow-shaped teeth
- Cuts longer without dulling Teeth made of tool steel
- Local demonstration arranged!

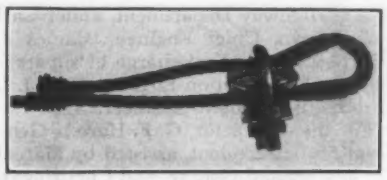
Also Sensational New One Man Saw
LOMBARD GOVERNOR CORP.
ASHLAND, MASSACHUSETTS

Wire-Rope, Guy Clamp

Wire rope and guy clamps designed to exert a continuing and increasing force on wire strands as the load increases are made by the Malleable Iron Fittings Co. of Branford, Conn. This force, the company explains, results from the tilting action of the U-bolt which produces a typical "come-along" grip. The U-bolts, originally set at right angles to the strand, tilt at the threaded end in the direction of the applied load by pivoting on the lugs provided on both sides of the separating block.

These clamps are available in three models with strand-diameter ranges of 3/16 to ⅜, ¼ to ½, and 5/16 to ½ inch —and with ratings of 5,000, 10,000, and 20,000 pounds respectively. For use under extremely corrosive conditions, or with stainless-steel strand, M.I.F. clamps are equipped with stainless-steel U-bolts and nuts in place of the standard carbon steel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 148.



This is a typical installation of the M. I. F. guy clamp on ⅜-inch 6 x 19 plow-steel wire rope.

Handbook on H-Piles

A 100-page handbook on H-piles has been prepared by the Bethlehem Steel Co., Bethlehem, Pa. This complete catalog covers the history, dimensions, properties, characteristics, safe load and design data, driving methods, driving formulae, load-testing information, and designs for installation of H-piles. Tables, charts, diagrams, drawings, and photographs provide useful data and illustrations of job applications to supplement the text.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 33.

Admixture for Concrete

A 4-page folder on Concretdense has been released by the Flexrock Co., Filbert and Cuthbert Sts., Philadelphia 4, Pa. It explains that Concretdense is a combination of chemicals in liquid form which is diluted with water and used instead of water in mixing concrete, allowing concrete to be laid at 30 degrees F without danger of freezing. It is said to lubricate the concrete mass and provides workability and economical placing and finishing. Description of this admixture includes mix proportions and suggested uses.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 8.

Mason Joins Noble Co.

Merritt Mason has joined Noble Co., Oakland, Calif., manufacturer of batching and concrete-handling equipment, as engineer in charge of steel-form design. He was formerly General Superintendent of Berkeley Steel Construction Co., Consulting Engineer for Western Pipe & Steel Co., and engineer with the Bethlehem Pacific Coast Steel Corp.

GMC radiator grilles are as durable as they are distinctive. All 300 to 900 series grilles are frame-mounted, angle-braced and surrounded by bars of heavy, spring steel bumper stock.

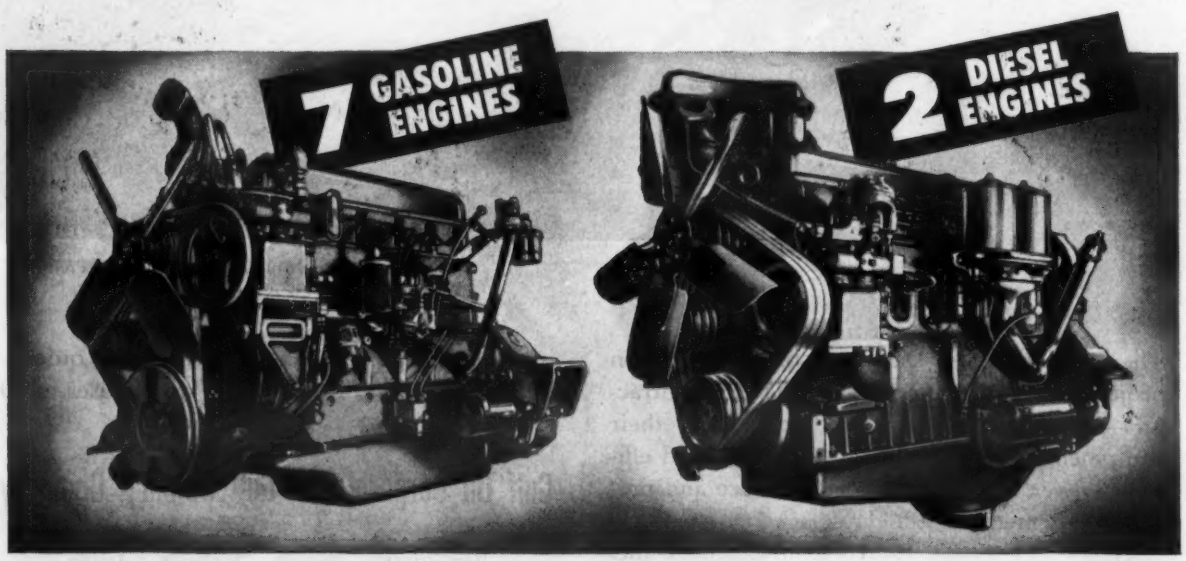
BACK OF THESE "BUMPER-BAR" GRILLES...

Best Engines in the Business

The increasing popularity and acceptance of GMC trucks are reflected in current registration figures which show GMC making substantial gains in new truck sales. In fact, new GMC truck registrations are the highest in the Company's history according to latest available figures.

Much of this increase can be attributed to the famous GMC truck-built engine line... because everyone recognizes the engine as the "heart" of any motor truck.

GMC now offers an engine range to fit every vocational requirement. Each engine, gasoline or Diesel, is the most powerful in its class with the most advanced features of design and construction ever offered by GMC. From every angle GMC truck engines are the "best in the business"... from every angle the best for your business.



GMC gasoline engines range from 228 to 503 cu. in. displacement and from 95 to 190 horsepower. From the smallest to the largest, they are all GMC-built... all of war-renowned "Army Workhorse" design.

GMC GASOLINE · DIESEL TRUCKS

GMC Diesel trucks are powered by famous GM 2-cycle four and six cylinder Diesel engines that are outstanding for light weight and great economy. The four develops 133 horsepower; the six provides 200.

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

RUD-O-MATIC
MAGNET REEL-TAGLINE COMBINATION

Rud-o-Matic Combination Magnet Reel-Tagline saves costly electric cable on overhead and boom crane magnet pick-up jobs. Steel tagline cable takes the load. Protective slack is maintained on electric cable. Models to fit your need.

Boom Crane or Overhead Crane Clam Shell Bucket or Magnet Pick-Up

RUD-O-MATIC TAGLINE CONTROL is your answer!

RUD-O-MATIC TAGLINE

holds the bucket steady at any angle of the boom. Heavy duty torsion coil spring assures constant tension at all times, at any length of cable run-out. Easily installed. Interchangeable for use on equipment of similar size. 8 models for various bucket sizes.

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USE RIGHT BUCKET FOR THE JOB

Hayward makes all three—clamshell, electric motor, orange peel. A Hayward recommendation is unbiased.

THE HAYWARD CO., 32-36 Dey St., New York

Hayward Buckets

The Retracta-Matic provides grip for snow, ice, and other slippery surfaces where rubber tires will not hold. It is bolted permanently to the tractor wheel, but is retractable so as not to interfere with the normal operation of the tractor.

Attachment Provides Improved Tire Grip

For positive traction under conditions where rubber tires will not hold, a permanent tractor-wheel attachment has been developed by the Ariens Co., Brillion, Wis., under the trade name Retracta-Matic. Once bolted to the tractor wheel, it stays there. With the removal of one safety bolt, it opens for use. It is retractable so that its presence on the tire does not interfere with the normal operation of the tractor.

It provides grip for snow, ice, mud, or other slippery conditions. Adjustable for full depth of penetration for mud, slush, sand, and other soft ground conditions, the Retracta-Matic is simple in design and is made of high-test steel to stand wear.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 124.

Rig Lighting Plants

Lighting plants originally designed to furnish electric current for oil-field rig lighting are now finding wide use in the construction field. These plants are manufactured by the Stewart & Stevens Services, 4516 Harrisburg Blvd., Houston 11, Texas.

The plants are powered by either a General Motors diesel engine or a Continental natural gas, gasoline, or butane engine. The diesel-powered plants are available in five models of 7½ to 25 kw; the gas-gasoline-butane units, in five models of 5 to 20 kw. The units are conservatively rated, the manufacturer states, and are guaranteed to be capable of operating at an overload up to 30 per cent in excess of rated capacity, for intermittent periods.

They are lightweight, compact, and skid mounted for portable service. A weather resistant sheet metal housing makes the units suitable for operation in any kind of weather. The control panel is a fully enclosed cabinet type, shock-proof mounted to protect damage to the meters during rough handling. All engine instruments as well as the meters, switches, etc., for the control of the generator, are mounted in this panel. Automatic air-circuit breakers are furnished as standard equipment and provide protection against overload or short circuit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 145.

Wood-Treating Co. Shifts

A realignment of sales responsibilities for two American Lumber & Treating Co.'s district offices was announced recently. C. D. Bird has been appointed District Sales Manager of the South Central Sales Region with offices at the Exchange Building, Little Rock, Ark. J. P. Johnson, Jr., formerly Sales Representative in Philadelphia, succeeds Mr. Bird as District Sales Manager of the Middle Atlantic Region. His office is located at the company's wood preserving plant on the Fairfield district waterfront of Baltimore, Md.

Fence for Snow Control

The snow-removal problem on many roads and highways can be materially lessened by installing snow fences some 50 to 100 feet from the windward side of the road to control drifting. A folder issued by the Illinois Wire & Mfg. Co., Joliet, Ill., highlights the use of Big Red snow fence for this purpose.

Features claimed for this product are: tight weave of wiring to prevent loosening of the pickets; sound timber pickets treated with a red mineral preservative to prevent decay; and an extra-heavy galvanized coating on the high-strength steel wire. Five double-strand No. 12½ wires are used on the 4-foot fence height.

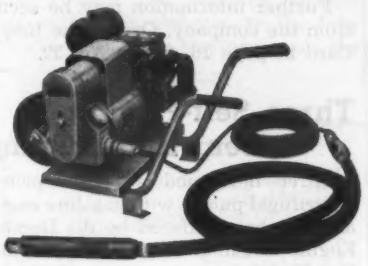
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 104.

LIGHTER . . . EASIER TO HANDLE . . .

you place concrete *FASTER* with a

MAGINNISS

HI-LECTRIC CONCRETE VIBRATOR



WHY? Because there's no flexible shaft! No engine to move! The Generator is set off the job, out of the way. Only a lightweight cable runs to the vibrator. One man operates it, the On-Off switch is at his fingertip. 9,500 VPM with no power loss insures faster and more uniform concrete placement.

SAFE? Sure, because generator and motors are wound for 110 volt, 180 cycle operation, and are grounded.

—EXTRA FEATURES—

The Hi-lectric Generator operates 2 vibrators, as well as standard floodlights and Hi-lectric Saws and Grinders. Versatility, light weight, low operating and maintenance cost are just a few of the many advantages of Hi-lectric equipment.

Maginniss POWER TOOL CO.

129 DISTL AVE., MANSFIELD, OHIO

PROTECT CONSTRUCTION MATERIALS FROM WEATHER

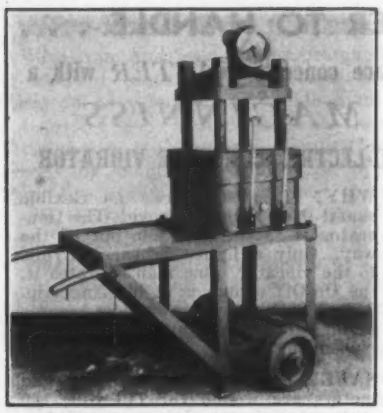
USE TARPAULINS

Economical canvas covers provide complete protection, virtually eliminating costly weather damage to machinery and materials.

Easy and quick to use, convenient to move about, always ready for protecting materials on the truck or ground — tarpaulins are the alert contractor's "must" equipment.

Call your tarpaulin dealer today. Be ready to beat the weather with canvas protection for every need.

NATIONAL COTTON COUNCIL . MEMPHIS, TENN.



Forney's, Inc., makes this portable concrete compression-testing machine for concrete blocks or cylinders.

Compression Testing With a Portqble Unit

A portable concrete compression-testing machine for use with concrete blocks or cylinders is manufactured by Forney's, Inc., 209 Elm St., New Castle, Pa. It exerts a ram pressure of 175 tons and is equipped with a specially calibrated pressure gage for direct reading. The testing unit has dual manually operated pumps; one brings the platen into position quickly, and the other exerts crushing pressure very slowly in accordance with ASTM specifications. Readings may be taken both at the time of initial fracture and at the point of ultimate failure.

A leveling plate is provided on the table so that blocks can be easily checked for high spots, and the lower platen is self-aligning in order to compensate for surfaces slightly off parallel. The company points out a particular application of this machine for manufacturers of concrete blocks who wish to run daily tests in order to control the variables which affect the strength of the blocks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 32.

Three Self-Priming Centrifugal Pumps

Three new models of self-priming centrifugal pumps with gasoline engines are now being offered by the Domestic Engine & Pump Co. of Shippensburg, Pa. Models, sizes, and normal capacity ratings are as follows: Model 3-M, 1½-inch, 50 gpm at a 40-foot total head; Model 7-M, 2-inch, 100 gpm at a 50-foot head; and Model 10-M, 2-inch, 150 gpm at a 50-foot head. The total heads given include a 10-foot static suction lift. The Model 3-M is constructed of aluminum, and all pumps can be furnished in cast iron or bronze.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

Magnetized Chains Secure Form Lining

A new development, designed to reduce time and cost on concrete work requiring absorptive or similar-type form lining, is a magnetized chain used to secure the form lining to steel forms. These chains, made by the Irvington Form & Tank Co., 43 Cedar St., New York 5, N. Y., allow the lining to be placed quickly, easily, and economically.

The chain is made of a series of U-shape nickel-steel channels bolted to a corded rubber strip. The 2-inch channel permits the chain to be used at seams, with each leg holding a side of the lining. According to Irvington, the chains are easy to place and adjust to insure a smooth lining with no rippling or wrinkling of the surface. They are withdrawn as the concrete is poured.

Magnetized chains are now being used to secure form lining to steel forms. The Irvington Form & Tank Co., New York, N. Y., makes them.

These chains are available on a rental basis. They are said to retain their magnetic properties for about one month. After this time the channels are connected to a remagnetizing device which will tap any 115-volt line and can be used right on the job.

Further information on these magnetized chains may be secured from the company. Or use the Request Card at page 16. Circle No. 39.

Profits for Everyone USING or MAKING Concrete with PROTEX AEA

contractors

Contractors cut costs through...
- Increased workability and placeability
- Faster finishing with Protex because of reduced surface water, finishing immediately after placing and less troweling.

Contractors using Protex can establish a reputation for placing higher quality and better appearing concrete.

block and pipe plants

Block and pipe plants cut costs through...
- Increased production
- Less green breakage of blocks
- Less breakage of pipe during stripping
- Increased material yield

Provides an opportunity to increase sales by establishing a reputation for selling higher quality and better appearing blocks and pipe.

ready-mix, pre-mix, etc.

Manufacturers of concrete, such as Ready-Mix and Pre-Mix, cut costs through...
- Saving in material
- Reduced segregation
- Faster discharge because of increased flowability

Provides an opportunity to increase sales by establishing a reputation for selling higher quality and better appearing concrete.

Protex is being widely used by: U. S. Bureau of Reclamation, U. S. Corps of Engineers, Bureau of Public Roads, State and City Governments.

● LOW COST PROTEX DISPENSER... AUTOMATICALLY DISPENSES PREDETERMINED AMOUNT OF AEA.

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Industrial & Research Division, Denver 9, Colorado

Please send me your book, "Facts on Modern Placement of Concrete Through Air Entrainment."

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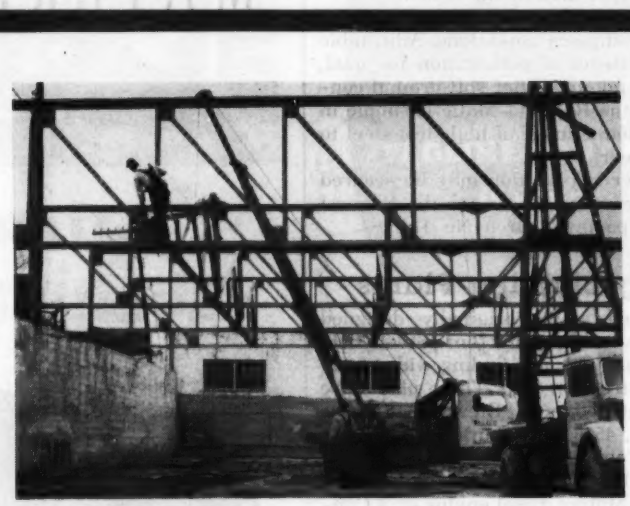

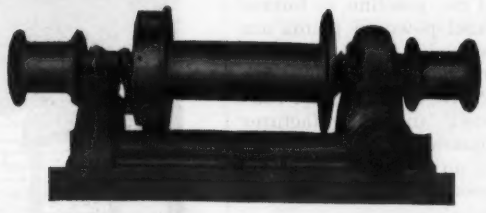

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makes construction jobs easier

For better winch performance, use Tulsa Winch — the choice of contractors and construction men. Winch models for all trucks — ½-ton and larger. Distributors in principle U. S. cities and Canada. Write for bulletin.

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TULSA, OKLAHOMA DIVISION OF VICKERS Inc

470 FOURTH AVENUE, NEW YORK 16, N. Y.
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for contractors, highway officials and distributors wanting further details or printed matter from the manufacturers advertising in these pages. Our Reader Service Department will be glad to forward any literature or special requests you mail to us at the above address.
CONTRACTORS AND ENGINEERS MONTHLY

Dredges Build Site For Navy Test Base

Unusual Scheme Tested To Prevent Slugging in Suction Intake as Two Dredges Enlarge Area

✦ BY INSTALLING a 24-inch breather device on the suction intake of the 27-inch hydraulic dredge Los Angeles, Standard Dredging Corp. has apparently solved a troublesome problem which has plagued levermen for years. The breather device is arranged to go into action when the suction vacuum reaches a pre-determined point between 18 and 28 inches, and it feeds clear water into the intake in case the cutter and suction mouth are slugged.

Caving banks and "mud-hungry" operators are thus no longer liable to shut down the dredge. In fact, the installation of the device has boosted the dredge's daily output, because the operators now know they can dig at capacity without hurting production.

Known as the D. L. Hofer patented by-pass, the device consists of a 24-inch pipe, one end of which is welded to the suction intake near the pump, and the other end of which reaches down into the water near the dredge hull. Near the gooseneck is an adjustable General Electric thruster valve, which under normal digging conditions remains closed. If a bank should cave down over the cutter, or the operator take in too heavy a slug of material, the thruster valve will then open automatically when the vacuum reaches the point on which the valve is set, letting clear water in. The destructive force of "water hammer" in long pipe lines is thus eliminated.

The unusual device is being used by Standard Dredging Corp. of Los Angeles, which with the joint-venture aid of San Francisco Bridge Co. of San Francisco has moved about 3,900,000 cubic yards of material for the Navy's Bureau of Yards & Docks under a $1,439,100 contract. The San Francisco Bridge Co.'s hydraulic dredge Beaver, a 15-inch rig, was also busy on the project.

Dredging under this contract was a part of construction for permanent facilities at the U. S. Naval Air Missile Test Center, Point Mugu, Calif., about 60 miles north of Los Angeles. The contract called for sand, gravel, and boulder material to be moved from the designated dredging area in Mugu Laguna to 12 separate fill areas. Some of the fill areas were placed to a finished grade, suitable for the immediate erection of permanent buildings, while other areas were stockpiled for future use in road embankments and missile-launching pads.

From a dredgeman's standpoint, the job was unusually difficult. Pipe lines up to 16,000 feet long were required to place some of the fill, calling for a booster pump. Some of the fill was designated as "sheet fill", only 12 inches thick. Some of the material for dikes, which enclose fill areas, had to be trucked in. A great deal of the pipe line ran through the swampy laguna to the fill areas. It was impossible to handle pipe lines here with equipment, and the lines all had to be handled and rolled by shore gangs. In many sections these men had to build a trestle for the pipe by driving 4 x 4-inch uprights, and nailing 2 x 10's near the ground line.

As if this in itself was not enough, the material itself was very abrasive. Although the dredge pumps were equipped with Ni-Hard liners, and welders worked 24 hours every Sunday on the pump shells, pumps had to be replaced an average of once a month.

Organization of the Job

The job was organized for maximum operating efficiency, under the field leadership of W. R. Osgood, Dredging Superintendent. Mr. Osgood has been connected with dredges and dredging for more than 35 years, and in that long period of time has pioneered many an improvement. One of his dredging innovations, the Osgood-type cutter, is in use on the Los Angeles.

The two dredges were assigned to the work each is capable of handling best. The small 15-inch Beaver is an ideal machine for handling yardage through short pipe lines, up to a maximum of about 3,200 feet. It will also stack a pile of dredged material considerably higher than a larger machine, without the use of extensive dikes. Assigned to this type of work in the contract, the Beaver has on occasion dug as much as the Los Angeles, though its sustained average was lower.

The 27-inch Los Angeles, on the other hand, was assigned to the long pipe line work. This machine made the type of fills where a large water run-off was not destructive. On the toughest part of the job, the Los Angeles performed up to expectations, with 25,000-cubic-yard average days, and 36,000-cubic-yard peak days. Started Novem-

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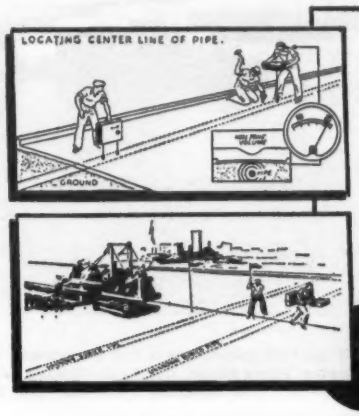

FISHER M-SCOPE PIPE & CABLE FINDER

. . locates, traces and measures the depth of buried pipes and cables even through concrete electronically. Eliminates costly exploratory digging.

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Fisher Research Laboratory, Inc.
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1,250,000 miles... .00012¢ per mile

transmission maintenance

Listen to what T. N. Busch, assistant superintendent, Woodlands Dept., International Paper Company, Georgetown, S. C., has to say about Fuller's economic contribution to the largest single paper mill in the world . . . producers of 1,350 tons of board per day. Mr. Busch says:

"We are using 10 Fuller Transmissions in our diesel trucks which have traveled a total of 1,250,000 miles. Our maintenance costs for these ten units amount to a total of $150.00. We are very much satisfied with this performance, particularly as the trucks are used under extremely heavy service involving on and off the road hauls of pulpwood."

Kraft paper and board mills have made a very great contribution to the economic welfare of the South . . . Fuller Transmissions have made a similar contribution to the largest of these mills, the International Paper Company.

Fuller Transmissions and Auxiliaries are built for long wear-life . . . for maximum road service without costly, time-consuming overhauls. In addition, Fuller Transmissions offer the advantages of easy shifts and quiet operation. That's why fleet owners specify Fuller.

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Dredges Build Site For Navy Test Base

(*Continued from preceding page*)

ber 22, the pumping job was expected to be completed by the middle of August this year.

The Dredge Los Angeles

The Los Angeles is the second dredge of the Standard Dredging Corp. fleet to bear that name. The first was lost at sea off Point Conception in 1944, while being towed from San Diego to Morro Bay. For a time the present dredge was known as Los Angeles No. 2, but the "No. 2" was finally dropped.

The Los Angeles is an all-electric rig, and was built in 1942 in the San Pedro yard of Standard Dredging Corp. She has a steel hull 130 x 44 x 11, is amply powered, and is equipped to dig in moderate seas from three stern cables, rather than her conventional digging spud which was used for the calm-water work in Mugu Laguna.

In her relatively short lifetime, the Los Angeles has dug some very important jobs. She dug the Anaheim ammunition-net depot, a small harbor at Morro Bay, a section of the outer harbor at San Pedro, and a part of the Long Beach-Los Angeles harbor.

Electric power for the Los Angeles on the naval-base job was supplied by transmission lines of the Southern California Edison Co. Power was furnished to the dredge through about 3,000 feet of flexible cable, which was handled on a reel inside a cable barge just astern of the dredge. Power reached the dredge at 11,000 volts. It was stepped down through transformer banks to 2,300 volts for use on the large motors, and to 440 volts for use on the smaller auxiliary motors.

The main electric motor aboard the Los Angeles, which drives the pump, is a 2,800-hp General Electric. It is not rated quite that high, but it is often made to develop that horsepower. The cutter motor is a 600-hp Westinghouse, and the motor which drives the swing-gear machinery is a 200-hp General Electric. There are 22 other smaller motors for such uses as light plants, ladder hoist, spud hoists, and so on.

The pump aboard the Los Angeles is somewhat unique in design and location. It is on the forward end of the dredge about even with the waterline but outside the area covered by the cabin. This makes it readily accessible. The derrick barge can easily maneuver into position, lift a pump out, and replace it in a comparatively short time.

Official Photograph, U. S. Navy

As part of construction for permanent facilities at the U. S. Naval Air Missile Test Center, Point Mugu, Calif., the dredge Los Angeles pumps material from Mugu Laguna to specified fill areas. The Los Angeles is an all-electric rig.

The pump itself is a Standard Dredging Corp. design, and is made to the company's specifications by several manufacturers. The pumps in use at the present time were made by a shop in Oakland, Calif., and several pumps have been made in Pittsburgh. The pump consists basically of an upper and lower half. The points where abrasion is most severe receive protection from Ni-Hard liners. The pump impeller has four vanes, and impeller diameters vary from 62 to 80 inches, depending on the length of pipe line, the type of material, the load, and other such variable factors.

When a pump shell is interchanged, the crew always bolts a blind flange over the intake as a safety measure in case the ladder should sink beneath the water. It is impossible for a backwash

(*Continued on next page*)

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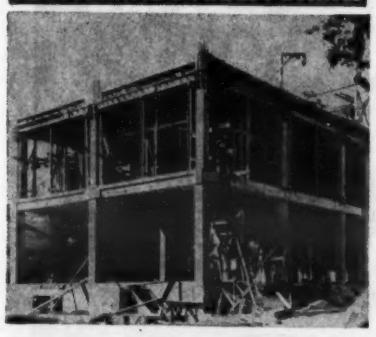

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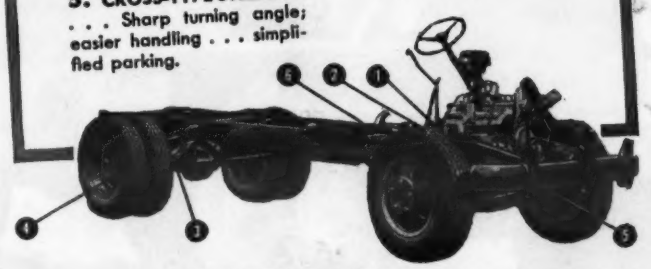

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356 BASIC CHASSIS MODELS, RANGING FROM 4,250 TO 23,000 LBS., G.V.W.

Official Photograph, U. S. Navy
To combat severe abrasion on the Mugu Laguna job, the cutter blades of the dredge Los Angeles were surfaced on the back with cast-iron welding rod and on the front by tube borium rod.

of water and material to sink the Los Angeles, because the pipe line leads outside the cabin and down the deck the full length of the port side, and the pump well, small as it is, is well protected by a steel coaming. The pump, cutter motor, and the Hofer by-pass valve take up practically all the space on the forward deck under the steel A-frame.

The steel A-frame which holds the weight of the cutter ladder is about 50 feet long and 30 feet high at the sheave. The ladder is 80 feet long, weighs 86 tons with the cutter and cutter shaft in place, is straight, and will dig to a maximum depth of about 55 feet. Project depth at Mugu is 15 feet below low water. According to many of the local sponsors of small boat harbors, this is an ideal depth for a small boat harbor. However, the intention of the job is something different from what local boosters think it is.

The cutter for the Mugu job was designed by Superintendent Osgood, after many years of trial, error, and experience. It is 7 feet in diameter and has five blades which are fastened to a heavy hub on the forward end. The backs of the blades are free and somewhat flexible. The shape of the blades and the pitch vary somewhat according to different materials, and cannot be described exactly.

To combat severe abrasion on the cutter, the back ends of the manganese-steel blades are surfaced with cast-iron welding rod, applied by the electric-arc process. The front ends of the blades and part of the hub are protected by tube borium rod. The back ends of the five blades line up almost exactly with the elliptical-shaped suction intake through which water and excavated material pass toward the pump.

The control house aboard the Los Angeles is situated directly up over the cutter motor, forward. It contains the electric control mechanism and gages for the operation of the dredge. Gages include an ammeter for load indication on each electric motor, a suction vacuum gage, pipe-line pressure gage, and an indicator for pressure on the Cutless rubber bearing at the cutter.

Other equipment for the dredge's operation consists of a 1¼-inch swing cable from 550 to 1,000 feet long on either side, connected to 6-ton Navy-type anchors. The dredge is also reported to be unusually effective when digging in moderate swells on her stern wires. These cables are laid out in the form of a triangle from the stern. The winch engine which controls these cables formerly saw service on an LST during the war. Equipped with a fluid-drive clutch, it performs quite well in taking up and holding the proper strain on these stern cables.

On the Mugu location, where the water is mostly calm, the Los Angeles was able to dig on her spuds. Her spuds are 70 feet long, round, made of steel, and are set outside the hull. The dredge digs on her port spud and makes her walking step on the starboard spud. A swivel elbow, which permits 180 degrees of movement, connects the stern of the dredge pipe line to the floating line.

Floating pipe line is assembled in 50-foot ball-joint sections. Each section is supported on a catamaran-type pontoon, consisting of two steel drums 56 inches in diameter x 24 feet long. A 10 x 12-inch timber strongback leads from the outside corner of one pontoon to another, holding them steady in moderate to heavy seas. The floating pipe line is held in place by anchors and winch scows. All floating pipe line is made safe for the dredgehands who have to walk it by a wooden catwalk and a light cable handrail.

Auxiliary Equipment

Several pieces of auxiliary equipment were used to tend the dredges. Long-range towing between Standard's San Pedro yard and the job was handled by a 200-hp heavy-duty tug powered by a 200-hp Union diesel engine. Lighter towing around the job was handled by a 115-hp tug with a Caterpillar engine, and a 175-hp tug with a General Motors engine.

A derrick barge capable of making a 24-ton lift was also used to change pumps, to raise pontoons for repairs or service, and to make other heavy lifts which were necessary from time to time. It has a steam boiler and steam hoisting equipment.

The anchor barge which is used to move the swing anchors ahead has a 2-drum gasoline-engine-driven Western hoist, a Kohler light plant, and a steel A-frame. Four mooring winches are used on the floating pipe line. Other equipment, used on land, consists of

(Concluded on next page)

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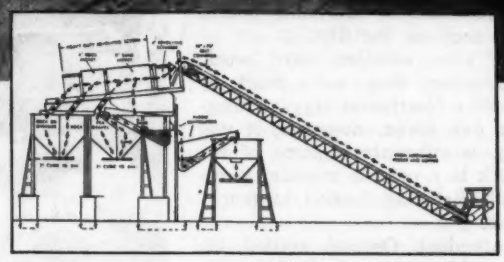

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Dredges Build Site For Navy Test Base

(*Continued from preceding page*)

two Caterpillar D6 tractors, with bulldozer blades and side booms, for handling shore pipe line, and two Northwest ¾-yard draglines which have been used for the construction of levees.

Dredge Beaver

The 15-inch dredge Beaver is a part of the San Francisco Bridge Co. fleet. She is a 15-inch machine and operates on the same principle as the Los Angeles. She performed beautifully on the Mugu job under the conditions she was working, often turning in daily yardage reports in excess of 12,000.

The steel hull under the Beaver is made up of steel pontoon sections bolted together. The dredge is demountable and could if necessary be dismantled and moved over land.

Her main pump is driven by a General Electric 600-hp electric motor. She has a 75-hp G-E cutter motor, a 25-hp G-E swing motor, and other small motors for pumps, ladder and spud hoists, and so on.

Land Work With Pipe Lines

The scattered disposal areas on this job complicated the disposal situation. Very long pipe lines, the use of a booster station on the Los Angeles pipe line, and extensive levee work were all characteristic.

Because a great deal of the marshy land under much of the pipe line was incapable of supporting a Caterpillar tractor with a side boom, a considerable amount of the pipe line had to be rolled by hand labor and installed on timber trestle work. This pipe line was all lightweight steel with taper slip joints. Where the location of pipe line was favorable to handling by tractor and side-boom equipment, Naylor pipe with Naylor couplings was used. Manual-type valves were used to switch the direction of flow on the dump areas. A special perforated spoon, with baffle plates to dissipate the force of flow, was used at the ends of the discharge pipes. It is a shop-built instrument made out of a half section of dredge pipe. The dump gang calls it a "corncob". Some shear boards were used along the levee toes to protect them from erosion, but baffle boards were not used on the fills.

Levees, also, entailed hard work. Where possible, they were built by casting with a Northwest ¾-yard dragline. For one levee, however, it was necessary to subcontract some of the earth work to a private trucking company. The dirt was hauled in trucks to the job.

Superintendent Osgood settled his spillway problem through the levees in a simple and inexpensive way. Instead of the old type of timber spillways, he used 48-inch corrugated-metal pipe which can be purchased for $6.50 per foot. The pipes were set in place by a dragline ahead of levee construction. Undercutting of the pipe was prevented by the use of a plywood collar, in two halves, placed around the pipe in the center of the earth portion of the levee. Backfill was compacted tightly around this collar.

Entrance Was Tricky

When the job was let, there was no entrance to Mugu Laguna through which a dredge like the Los Angeles could pass. The channel was shallow, crooked and tricky. The only way to get in was to dig an entrance channel with the Beaver, but this in itself involved a great deal of danger.

Picking a high plus tide, on a quiet day, the Beaver slipped through successfully. Working from the inside, it dug a 200-foot channel about 12 feet deep. The Los Angeles was then towed to the job, but high winds and seas made the entry so treacherous that the tug returned to Port Hueneme that night with the Los Angeles. By the next day the channel had silted up somewhat, but the tug barreled through the narrow entry with the Los Angeles and got out again by itself. Additional dredging will be necessary when the job is done to get the machines out of the laguna.

Personnel

The job for the Navy Bureau of Yards & Docks is under the general supervision of Admiral J. J. Manning, Chief of the Bureau, with Commander Raymond Lamoreaux locally in charge as Officer in Charge of Construction. Captain Robert H. Hatcher is the Commanding Officer at the base.

On the dredge Beaver, Walter Leutholtz is Superintendent and J. W. Patton is Chief Engineer. The Los Angeles is headed by Superintendent S. A. Sellgren, with N. J. Nielson as Chief Engineer. W. R. Osgood was in general charge of the job, under direction of the Los Angeles office of Standard Dredging Corp. which is headed by G. G. Daneri.

Electric-Tool Salesmen

The Black & Decker Mfg. Co., Towson, Md., announces the appointment of Earl Roberts as Sales Engineer with the Memphis branch. David Rolston has joined the Black & Decker organization and will be Home-Utility Sales Representative in the Philadelphia area.

Buckets and Grapples

A 28-page catalog on buckets and grapples has just been released by The Owen Bucket Co., 6030 Breakwater Ave., Cleveland 2, Ohio. The catalog illustrates and describes the features common to all Owen buckets and grapples and presents recommendations to aid in selecting the proper type of bucket for various kinds of service.

A large number of photographs and engineering drawings illustrate design, construction, and performance features. Ratings, size dimensions, and weights for all models are given in a series of tables.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 122.

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J. S. Bright Retires

J. S. Bright, Deputy Commissioner of the Bureau of Public Roads, has retired after 32 years of service. He celebrated his 71st birthday two days prior to his retirement.

Mr. Bright accepted an appointment with the Bureau in 1917, after many years of engineering work in the southwestern states. He served as Senior Highway Engineer in the Public Roads regional offices from 1917 to 1919, when he was appointed District Engineer in charge of all Federal-Aid road work and Federal construction in some of the national forests.

In 1922 he was transferred to the Western Headquarters office as Chief Construction Engineer. In 1924, when Federal Aid was extended to Hawaii, he organized the Public Roads office there and initiated the planning and construction of the islands' road system. During the war years Mr. Bright supervised the construction of the Alaska Highway. He was appointed Deputy Commissioner in 1944, with headquarters in Washington, D. C., and until his retirement was in charge of construction and maintenance operations of Public Roads.

For Spreading Operations

A catalog describing the Brokol spreader is available from the Brokol Mfg. Co., Inc., 94 Madison St., Newark, N. J. It is designed for spreading sand, cinders, salt, or anti-skid mixtures on icy pavements, and sand, stone, or chips on bituminous treated roads.

Its spreading capacity is from 4 to 20 feet, and can be regulated by the speed of the truck or by adjustable deflector plates fastened to the side of the hopper. Thickness of spread is regulated by raising or lowering the spreader disk. A self-locking coupling simplifies attaching to trucks.

This catalog, No. N-39-4, lists the specifications and features of the Model 20 spreader. A schematic diagram indicates the coupling connection of the spreader. Replacement parts for the spreader are listed on the back page of the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 157.

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Tilting-Type Model Of Concrete Mixer

A new tilting-type 3-cubic-yard concrete mixer has been developed by Glenway Maxon, 757 N. Water St., Milwaukee 2, Wis. It is said to offer a number of new design features: it is optionally powered with gasoline, diesel, or electric drive; it has a high discharge, and it tilts up, to discharge directly to bucket, dump truck, or truck-mixer; it requires no compressed air for operation; and a consistancy meter is included. Portable models of the Expressway mixer are available.

Further information may be secured from Mr. Maxon. Or use the Request Card at page 16. Circle No. 100.

Measuring Device

Rapid measurements can be taken in the field by one man with the aid of the Rolatape, a new device introduced by the Co-Jay Corp., 1026 W. Hillcrest Blvd., Inglewood, Calif. Featuring a wheel with a fixed measuring tape recessed between rubber rims, the Rolatape may also be used to measure objects and structures.

The back edge of the wheel is placed at the starting point. Grasping the telescoping handle, the user rolls the wheel along until its front edge reaches the destination. The figure indicated on the tape by a pointer is then added to the footage registered on a recorder at the side of the wheel to determine the total distance measured. Because the starting point on the tape is set at 7½ inches to compensate for the diameter of the wheel, accurate measurements may be made from wall to wall.

The Rolatape is equipped with a bell which rings each time 100 feet have been traversed. By keeping track of the ring, measurement can be continued indefinitely. Other features of the Rolatape are light weight and a telescoping handle which shortens to 20 inches for carrying or storing. The rubber rims of the device keep it from scratching or marring finished surfaces.

Further information may be secured from the company. Or use the Request Card on page 16. Circle No. 71.

Wedged Moil Point

A new type of moil point employing a wedge design is now manufactured by The Dallett Co., Mascher at Lippincott St., Philadelphia 33, Pa. The wedge shape, the company says, permits follow-through on impact and widens the fracture as power is applied. Two sizes, 1⅛ inch and 1¼ inch hexagonal, are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 6.

Folder on Disc Wheel

A circular on the Geneva 14 x 4:00 puncture-proof semi-pneumatic-tired wheel is offered by The Geneva Metal Wheel Co., 1012 Railroad St., Geneva, Ohio. This sheet contains specifications and all pertinent information about the D265 disk wheel and tire. The company recommends it for road machinery and for materials-handling and industrial equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 23.

New Richkraft Salesmen

The Richkraft Co., Chicago, Ill., manufacturer and distributor of reinforced waterproof building papers and road-curing blankets, has announced the appointment of four new salesmen to cover Arizona, New Mexico, and Texas. E. B. Randall will headquarter at Houston, Texas; Dave Gibson, Sr., at Amarillo, Texas; and D. V. Livoni and C. H. Hays at Phoenix, Ariz.

Colored Truck Lane On Up-Hill Pavement

Red-Tinted Third Concrete Strip Is 6,000 Feet Long Up 6 Per Cent Grade; to Ease Traffic Congestion

By WILLIAM H. QUIRK,
Eastern Editor

(*Photo on page* 1)

✦ THE Tennessee Department of Highways, in paving 10.55 miles of U.S. 241 with a 22-foot concrete slab, added a third 12-foot lane, colored red, for the use of slow-moving vehicles in negotiating a steep hill 6,000 feet in length. The project is located in Lincoln County, in the south-central part of the state, and extends from Fayetteville south to the Alabama state line. With the exception of 1.6 miles at the north end, just out of Fayetteville, the job is on new location, being situated east of the original road. It rejoins the existing highway at the state line. The new concrete pavement, with improved alignment and grades, supersedes an old 16 to 18-foot-wide bituminous surface-treated pavement.

The red-colored truck lane begins a short distance out of Fayetteville at the bottom of Wells Hill. The added 12-foot strip of concrete climbs a 6 per cent grade for nearly the entire 6,000 feet of hill. At the summit, the pavement drops back from 34 feet wide to the standard 22-foot slab. The truck lane is on the west side of the road for the use of south-bound slow-moving vehicles. This leaves the other two lanes for the faster-moving cars, thus reducing congestion and eliminating a dangerous traffic hazard occasioned by drivers attempting to pass crawling trucks and busses on the long hill.

Separate Grading Contract

Grading for the newly located Federal route was done in 1947 by the Wolf Construction Co. of St. Augustine, Fla. Last year the Tennessee Department of Highways awarded a contract for the 10.55 miles of reinforced-concrete pavement to the Wright Contracting Co. of Columbus, Ga., on its low bid of $520,531.38. Paving got under way on October 23, 1948, and continued up until December 20, when unfavorable weather brought the construction season to a close. Heavy winter and spring rains delayed the resumption of operations until April 11, 1949. From that point on progress was steady, and the last batch of concrete was dumped between the forms on May 23. An additional three weeks was required for grading and shaping the shoulders.

When the original grading contract was completed, the roadbed was surfaced with crushed stone and opened to traffic for nearly a year before paving started. By that time the base was well compacted, and the fills had taken their full settlement. The new pavement was laid the full 22-foot width, with traffic using the existing road on the old location as a detour. The concrete is reinforced, has an 8-inch uniform

C. & E. M. Photo
Wright Contracting Co. workmen hand-screed the narrow portion of the colored truck lane on U. S. 241 near Fayetteville, Tenn.

depth, and is flanked by 10-foot shoulders. There is no center crown in the pavement, the slabs being tilted so as to drain off to either one side or the other.

There are no expansion joints in the pavement, but dummy contraction joints are spaced at 20-foot intervals. Down the center of the 22-foot concrete slab, and also along the side adjoining the truck lane, the pavement is reinforced with steel dowels, 30 x ½-inch, placed on 30-inch centers mid-depth in

(*Continued on next page*)

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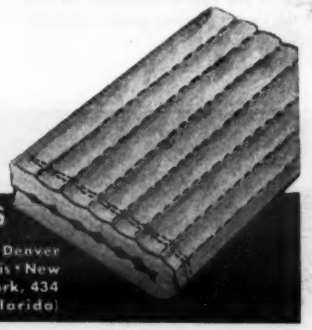

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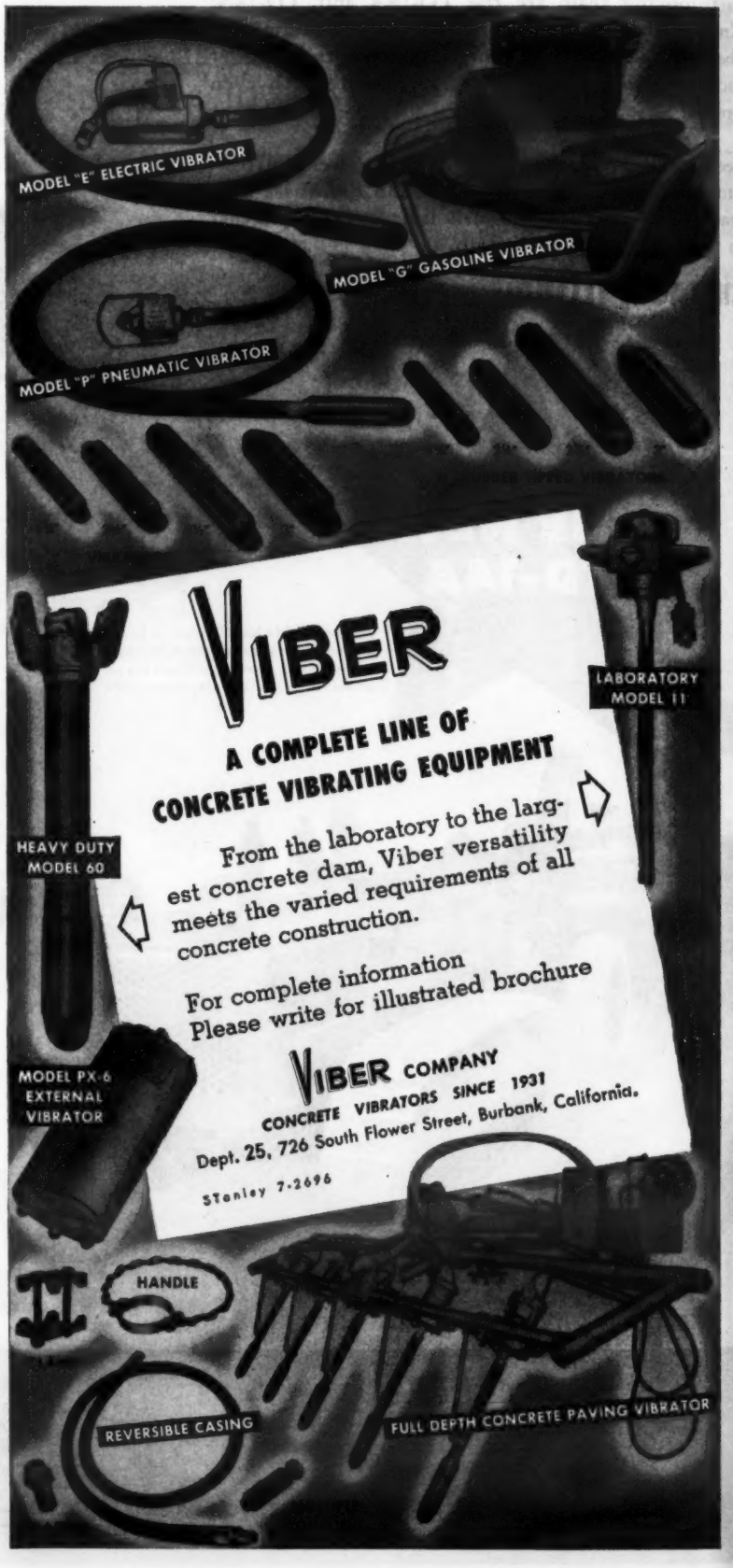
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MODEL PX-6 EXTERNAL VIBRATOR
HANDLE
REVERSIBLE CASING
FULL DEPTH CONCRETE PAVING VIBRATOR

the concrete. Above these joints the pavement is reinforced with wire mesh for the full width. A longitudinal steel joint also runs down the center of the pavement. It comes in 10-foot strips, and is 7½ inches deep x 1/16 inch in thickness. The pavement metal was supplied by Bethlehem Steel Co.

Batch Plant

The contractor set up his batch plant in Fayetteville on a siding of the Nashville, Chattanooga & St. Louis Railroad, about one mile from the north end of the job. All materials were received by rail. Bulk cement came from the Cumberland Portland Cement Co. at Cowan, Tenn., was unloaded from the cars by the conventional screw gear and enclosed elevator, and was stored in a Heltzel 150-barrel cement bin. Sand was supplied by the Estill Springs Sand & Gravel Co. of Estill Springs, Tenn., about 40 miles from the job. The Cumberland River Sand Co. of Nashville, Tenn., furnished the gravel. A 701 Koehring crane with a 55-foot boom and a Blaw-Knox 2-yard clamshell bucket unloaded the aggregate from the gondola cars, and either stockpiled the material or else charged the Heltzel 100-ton aggregate bin that was used for storage.

C. T. West of Dahlonega, Ga., hauled the dry batches to the paver with a fleet of trucks that averaged 23 in number; a peak of 30 vehicles was reached at one stage in the work. The trucks held two batches each, with the cement being contained in metal tanks until the batch was discharged into the skip of the paver. The maximum length of haul was 11½ miles, there being a one-mile dead haul at the north end of the job. Paving started at the south end of the project and progressed to the north.

The dry weights of a typical 1⅓-cubic-yard batch of concrete were as follows:

Cement	783 lbs.
Sand	1,700 lbs.
Gravel (1½-inch down)	2,500 lbs.
Water (6½ gals. per bag)	448 lbs.
Total	5,431 lbs.

Water for the mix was drawn from hydrants in Fayetteville, and hauled to the job in two 1,200-gallon tank trucks. The usual procedure was to have one truck feeding the paver while the other was going after a fresh tank of water. The water was pumped from the tank truck into the paver by a CMC 3-inch pump mounted on a small trailer that was pulled along by the truck at the paver.

Paving Preparations

In preparation for the paving operations the roadbed was brought to grade by a Caterpillar No. 12 motor grader, after which the Heltzel steel forms were set by hand. There were 5,000 linear feet of these forms on the job, of which 500 to 800 feet were always kept ahead of the paver on both sides. Beyond that, gaps were left in the forms to admit the batch trucks. An R-B Fine-grader then moved along over the forms, throwing off to the side any excess dirt occupying part of the cross section of the concrete slab. The subgrade was then given a final compaction with a Buffalo-Springfield 10-ton 3-wheel roller.

Batches were mixed for 1¼ minutes in a Koehring 34-E Twinbatch paver, equipped with a 35-foot boom, working between the parallel rows of steel forms. Directly behind it the paver pulled a Heltzel planer for a final check on the depth of grade. The forms were oiled and the subgrade was wet down with a hose hooked to the paver. The mixed concrete was discharged from the bucket in front of a Blaw-Knox paddle-type spreader. The concrete was held to the proper level for setting the steel by a strike-off that was pulled along by a winch mounted on the paver. The strike-off leveled the concrete 4 inches from the top of the forms. First the dowels were placed and then the wire mats, after which more concrete was dumped on top to fill the forms. The steel longitudinal joint was set down the center line immediately behind the paver.

C. & E. M. Photo
Fresh concrete on the Tennessee concrete-paving job gets a roughening with a steel broom before application of a curing compound.

Concrete Finishing

Behind the spreader came a Jaeger finishing machine that was followed by a bridge from which the steel strips were inserted in the concrete to form the dummy joints. The strips were 2¼ inches deep x ¼ inch thick, and came in 11-foot lengths so that two were required at each joint in the 22-foot pavement. A Koehring Longitudinal Finisher then made a pass over the concrete,

(*Concluded on next page*)

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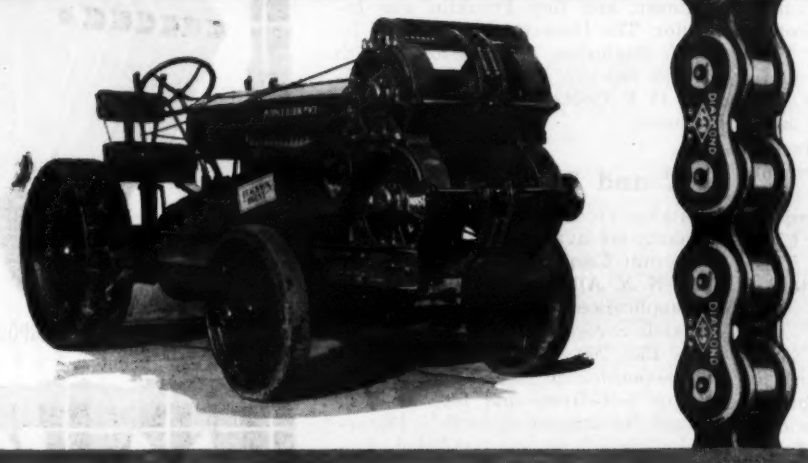
On This Trackson "Old Timer"



Diamond Roller Chain Drives had to be rugged on this heavy forerunner of Trackson equipment.

and Modern CD4 Swing Cranes

TRADE MARK

This compact high-speed late model Trackson Swing Crane is also equipped with durable Diamond Roller Chains.

Then As Now Equipped With

DIAMOND ROLLER CHAINS

DIAMOND CHAIN COMPANY, INC. Dept. 487, 402 Kentucky Avenue, Indianapolis 7, Indiana

Colored Truck Lane On Up-Hill Pavement

(*Continued from preceding page*)

working the excess material to the forms. The surface was carefully checked with two long-handled 10-foot straight-edges, and any laitance was removed with an 8-inch-wide rubberized canvas belt that was pulled lengthwise over the slabs.

As the concrete acquired an initial set, the finishers removed the steel strips at the dummy joints, and roughened the wearing surface of the concrete with a steel-bristle broom pulled from one side to the other. The joints were edged with a ¼-inch-radius tool, 12 inches long and with an 8-inch base —4 inches on each side of the joint. The dividing strip projected 2 inches into the concrete. It was felt that a flatter joint was possible with this type of edger that had a 4-inch lip on each side to bear evenly on the surface of the concrete.

Curing of the concrete was done with Kuraseal, a compound that was applied at the rate of 200 square feet to the gallon. It was sprayed on with a Flex-Plane machine. The forms were quickly removed from the hardened concrete with a Nelson form puller mounted on a truck, and loaded onto other trucks that moved them ahead. This unit pulled an average of 1,500 linear feet of forms within two hours.

Some time later, the joints, both dummy and longitudinal, were poured with RC-5 asphalt that was heated in a kettle. With this equipment, the contractor averaged 1,500 feet of 22-foot pavement in a 10-hour working day. The best day's record saw 708 batches deposited between the forms to account for 1,760 linear feet of full-width pavement. This was done in 9 hours and 40 minutes.

Colored Truck Lane

Paving of the colored truck lane started on top of the hill and worked northward in the direction of the batch plant. In the last 800 feet the width of the lane gradually decreased from 12 feet to 1 foot in a transition to meet the 22-foot white-colored pavement. The coloring was obtained by adding 33 pounds of red oxide to each batch after it was discharged from the trucks into the skip of the paver. The colored concrete was placed only in the upper 2 inches of the truck lane.

The concrete in the 12-foot lane was finished with a Blaw-Knox finishing machine. When the narrow transition section was reached, the boom and bucket of the paver were disregarded, and the concrete was discharged from the mixing drum down a chute into the forms. Screeding was also done by hand when the section became too narrow for the machine.

After this final phase of the paving was completed, the 10-foot shoulders were constructed. Dirt was either pulled up into place from the sides by an 8-yard LeTourneau Carryall pulled by a Caterpillar D7 tractor, or else dug out of borrow pits by a Lima ¾-yard shovel that loaded a fleet of four 4-yard trucks. Two Caterpillar No. 12 motor graders leveled off the shoulders, and a final shaping of both shoulders and slopes was done with a Fordson tractor equipped with a short blade working along behind the graders.

Quantities and Personnel

The 10.55-mile contract contained only two major items—144,000 square yards of reinforced-concrete pavement, and 20,000 cubic yards of grading. The latter item was chiefly at the north end of the project. During the peak of construction the Wright Contracting Co. of Columbus, Ga., employed a force of 110 employees under the direction of Bill Blount, Superintendent. H. E. Gregory was Concrete Foreman.

For the Tennessee Department of Highways, V. A. Cline was Resident Engineer, and Roy Franklin was Inspector. The Department is headed by E. W. Eggleston, Commissioner, with Sam M. Squires, State Highway Engineer. O. F. Goetz is State Construction Engineer.

AC and DC Arc Welders

Catalogs on both ac and dc arc-welding units are available from the Metal & Thermit Corp., 120 Broadway, New York, N. Y. All features, specifications, and applications are fully described.

Models covered in this literature include 150, 200, 300, and 400-ampere single-operator dc models—motor, engine, or belt-drive—and 160, 200, 300, 400, and 500-ampere ac models. Photographs, drawings, and exploded diagrams are used to illustrate the construction of the M & T arc welders. Specific models with a variety of operating current are designed to cover a wide range of work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 10.

Facts on Steel Sheeting

A 4-page illustrated folder on corrugated-metal sheeting is now offered by Armco Drainage & Metal Products, Inc., 702 Curtis St., Middletown, Ohio. Armco steel sheeting ranges in length from 6 to 20 feet or more in 2-foot increments. Nominal covering width is 14 inches for the interlocking type and 12 inches for the flange type. Cross-sectional drawings and photographs illustrate both types.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 40.

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6" TO 36" SHEAVES
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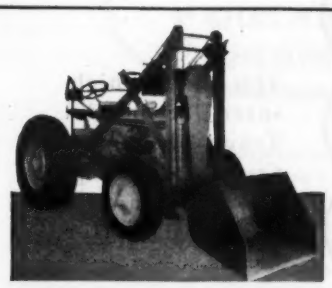

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KIM Hotstart preheats engines, makes them start instantly, regardless of weather.

Despite cold winter weather, Spokane County keeps its trucks outdoors all year round — and engines start easily every morning. Depreciation is reduced and maintenance costs are unusually low.

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The Jordan post driver has a 100-pound hammer with a free drop of 80 inches. It is designed to handle metal snow-fence posts quickly and easily.

Fence-Post Driver

A new power post driver designed for driving metal snow-fence posts has been developed by the Henrici Laundry Machinery Co., Henrici St., Mattapan, Boston, Mass. The Jordan post driver is powered by a standard 2½ x 2¾ one-cylinder gasoline engine, and may be mounted on any truck or small trailer for field operation. Its 100-pound hammer, with a free drop of 80 inches, is said to drive metal posts quickly and easily.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 95.

Small Patching Roller

A folder describing the Ferguson 152 maintenance roller is offered by the Shovel Supply Co., P. O. Box 1369, Dallas 1, Texas. This small-size roller, with its 20-inch-diameter front roll and 32-inch-diameter rear roll, each 24 inches wide, is designed for asphaltic patching of highways and streets. A lowering mechanism permits rapid towing on two pneumatic-tired wheels, for portability.

The catalog explains that the Ferguson 152 obtains a 152-pound pressure per linear inch on the rear roller. Powered by an air-cooled 6-hp engine, the roller operates at speeds of 1½ mph, forward or reverse. Features and specifications are included, along with operation photographs of the roller.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 153.

Schlenk Joins Thew

E. B. Schlenk has been appointed direct factory representative, attached to the New York office, of The Thew Shovel Co., Lorain, Ohio. Schlenk will handle contacts on export sales and national accounts in the New York area. Mr. Schlenk secured his construction equipment experience as Branch Manager for Roy C. Whayne Supply Co., Kentucky equipment distributor. Just prior to joining Thew, he was active as an export broker on the West Coast.

Tail-Gate Spreader

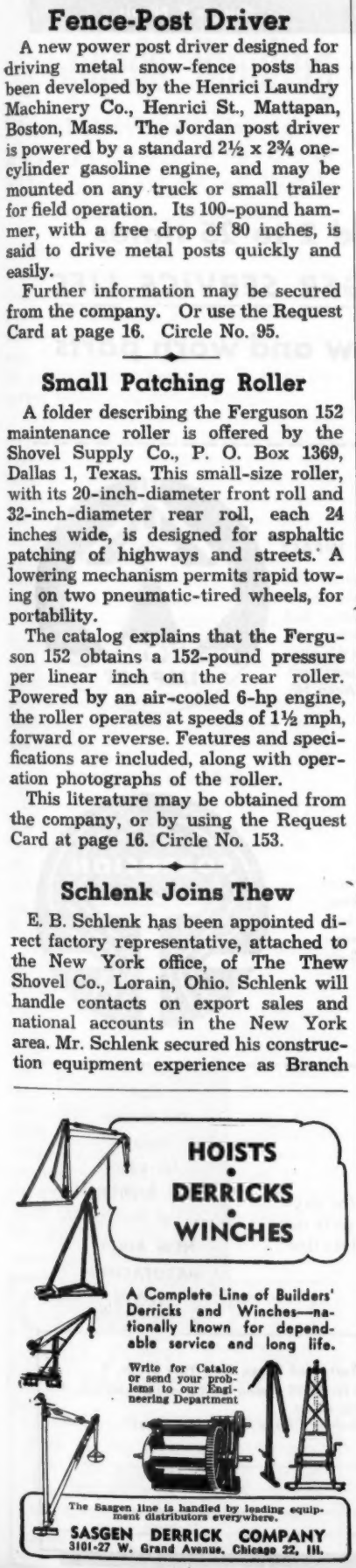
A combination tail-gate spreader for ice control and for seal-coat work has been developed by Century Engineering Co. of Waukesha, Wis. Paul M. Cole Co., 30 N. La Salle St., Chicago 2, Ill., is national distributor for the unit.

This spreader is hydraulically operated and fits any hydraulic dump truck up to a full 8 feet in width. It does not interfere with the truck tail-gate, and can be removed or installed in 10 to 15 minutes. The hydraulic system is independent of the hoist mechanism and requires from 6 to 8 man-hours for installation. It is completely out of the way when not in use. The spreader is one-man-operated from the dash in the truck cab, and has no linkage on the truck floor.

This new combination tail-gate spreader, shown spreading seal-coat chips, may also be used for ice-control operations.

Chips up to 1¼ inches in size can be put down by the seal-coat tray up to 13 feet wide. When used for ice control, it spreads from 2 feet wide, where salt or chloride are used, up to 40 feet wide for sand or cinders. The material can be dropped directly down from the spreader onto the pavement or the spinner can be attached for larger area spreading.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.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Facts you should know about the New General Motors Diesel Engine-Torque Converter Unit

Two 190 H.P. 6-Cylinder GM Diesel Engine-Torque Converter units power the new 34-ton Euclid 1-FFD tandem axle rear-dump. Each engine drives one rear axle, eliminating the conventional inter-axle power divider. A 3-speed Allison Torqmatic transmission does away with the clutch pedal and manual shifting. Designed for off-the-highway haulage of large tonnage, the mammoth 1-FFD has a top speed of 25.4 m.p.h. with full pay load.

ONE MANUFACTURER ONE RESPONSIBILITY The new torque converter is specifically designed and manufactured by General Motors as an integral unit with the Series 71 two-cycle Diesel engine. Result: a big saving in size and weight—no compromise designs—no divided responsibility.

AUTOMATIC SHIFT FROM TORQUE MULTIPLICATION TO FLUID COUPLING Desirable features and advantages of *both* torque converter and fluid coupling are combined in this converter. Continuous *automatic* transition from 3.6-to-1 torque ratio at stall speed to 1-to-1 torque ratio in fluid coupling. Unit goes into fluid coupling whenever load requirements equal engine torque, without regard to output shaft speed.

MORE WORK IN LESS TIME This new power unit gets the most work done in the least time. Because it is not rigidly geared to the load, the engine responds to the throttle and immediately accelerates to a high output range regardless of the speed of the load.

FREEDOM FROM SHOCK LOADS Transmission of power through a liquid, cushions both engine and driven machinery from sudden shock loads. Operation is liquid-smooth (free from jerks) at any speed or throttle setting.

FREEDOM FROM STALLS WITH OVERLOAD Fluid circuit prevents engine stalling under any load condition. Ability to exert a smooth pull at any output shaft speed down to zero permits GM Converter-equipped machines to do some operations that are impossible with conventional units.

EASE OF HANDLING Eliminates time lost in unnecessary low gear operation. Operator fatigue is reduced. Work is speeded up with less effort on the part of the operator.

WIDE RANGE OF MODELS The new GM Diesel Engine-Torque Converter unit is made available in 3-, 4- and 6-cylinder single engine units, Twin 4 and Twin 6 multiple engine units with engine ratings from 64 to 294 B.H.P. to meet a wide range of power requirements. *Write or wire for full details.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... *Up to 200 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS... *Up to 800 H.P.*

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

On this Northwest Model 3, loading sand and gravel at the Commonwealth Sand & Gravel Corp., Richmond, Va., CenterFit drag cable lasted 160 hours as compared to 90 to 100 hours for conventional wire rope, it is reported.

Wire Rope Contains An Integrated Center

A new exclusive eight-strand rope with an integrated steel-wire center has been developed by Jones & Laughlin Steel Corp., 311 Ross St., Pittsburgh 30, Pa. This wire rope, called CenterFit, consists of seventeen separate wire strands closed in a single operation.

The company claims that CenterFit, compared to conventional six-strand rope with an independent wire-rope center, has the following advantages: smoother external bearing surface, better internal bearing, greater flexibility, greater strength, more metallic area of the cross section, and more equal stress distribution. CenterFit is available in Permaset (preformed) construction if desired.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 72.

New Spraybar Made To Fit All Distributors

A spraybar made to fit all distributors is now being produced by The Fraco Mfg. Co., Box 387, Richwood, Ohio. This bar, made in lengths from 10 to 24 feet, is full-circulating within and, when properly operated, needs no preheating, the company says. Swing unions enable the full bar length to be taken to and from the job without dismantling.

The Fraco spraybar is said to have instantaneous shut-off for clean starts and stops. Nozzles are 4 inches on centers, with nozzle clips to limit the spray. The bars are made to fit any distributor and may be purchased as optional equipment on Kinney and South Bend distributors.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 99.

Ice and Snow Melting

A new leaflet descriptive of Ice Rem, ice and snow-melting chemical powder, has been released by Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. Thawing capacity of a pound of the powder is said to be approximately equivalent to 10 pounds of salt.

Ice Rem is applied by sprinkling liberally over the surface, the amount used being dependent upon ice or snow thickness. If used at the beginning of a snow or sleet storm it is said to melt subsequent light snow falls. A handful thrown under rear car wheels provides traction and stops wheel spinning. The powder is likewise suitable for thawing frozen gutters, pipes, sewers, etc. Ice Rem is available in 9½-pound cartons, 24½-pound fiber pails, and 90-pound fiber drums.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 116.

Care in Batcher Selection Helps to Reduce Job Costs

Careful selection of a concrete batcher results in the economical use of materials, men, and equipment. Factors to be considered in the selection are the unit's capacity, cost, flexibility, design, and portability.

These factors are given individual attention in a folder on the Winslow Binanbatch issued by the Winslow Scale Co., 25th and Haythorne, Terre Haute, Ind. Winslow manufactures portable batchers, with two or three bins, in capacities up to 23 tons for loading mixers up to and including a 16-S. The bulletin includes specifications, design features, and illustrations of the Binanbatch. Photos show the unit assembled on the job, and dismantled and loaded on one truck for transporting.

Literature on the Winslow Binanbatch may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

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Super-strong Hyway Guards safely deflect cars and cushion shock to vehicle, occupants and rail. Easily seen by day or night. Speedy, permanent erection with little or no maintenance required.

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IMPACT

Parts subjected to impact, like bucket lips, last longer when hardfaced with Airco Electric Self Hardening Alloy. Furthermore, parts can be rebuilt with this alloy at a fraction of new part cost. For *shattering impact*, Airco No. 388 is recommended.

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Aircoloy 1 and 6 effectively resist wear caused by heat and corrosion . . . for example, parts subject to intense heat, such as ingot tong bits, exhaust valves and seats, tap hole augers, and hot punches, last from 2 to 25 times longer when protected with these NEW Airco Hardfacing Alloys.

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In tilt-up building construction as practiced by the General Construction Co. of Columbia, S. C., forms for the walls are built on the concrete floor slab after it has dried (left). The wall is troweled after it has been poured in the form (above).

"Tilt-Up" Method Speeds Building

Flexibility and Economy Result from Pre-Cast Tilt-Up Method of Wall-Panel Construction

✦ THE pre-cast tilt-up method of concrete construction is being used a good deal for commercial, residential, and industrial building in the southeast. A novel method of construction four years ago, it has won acceptance because of its architectural flexibility, ease of exterior treatment, and economy.

The procedure in this type of construction—which may be described as cast-tilt-place construction — consists, first, of building footings, foundations, and the ground floor in the usual manner. The wall panels are then poured on the dried floor slab which serves as part of the form. This eliminates the usual forms and bracing required for the conventional method.

On single-story buildings, the customary procedure is to erect the panels first, later tying in and pouring the columns. In multi-story work, where two hoisting rigs are used, the concrete columns and beams are poured before the panels.

Pioneer in the Method

One of the pioneers in the method was R. E. Fulmer, owner of the General Construction Co. of Columbia, S. C. Mr. Fulmer has used the method on both single-story and multi-story buildings, including an eight-story $1,000,000 office building.

He points out that although different contractors are now using slightly different methods to achieve the same results the main need of the contractor is plain common sense. Usually no change in the actual design is necessary, and the only difference is the method by which the work is done. Mr. Fulmer also points to the economy and flexibility of this method of construction. Panel lengths and heights, for example, can easily be adapted to meet a wide variety of requirements; electrical and other conduits often can be placed before the pouring of the concrete.

The largest panels that have been used by the General Construction Co. were 30 feet long x 15 feet high, but Mr. Fulmer declines to name a figure for the largest panel it is feasible to handle. The thickness of the panels is usually 6 or 8 inches, depending upon job conditions, area of the panels, and

(*Concluded on next page*)

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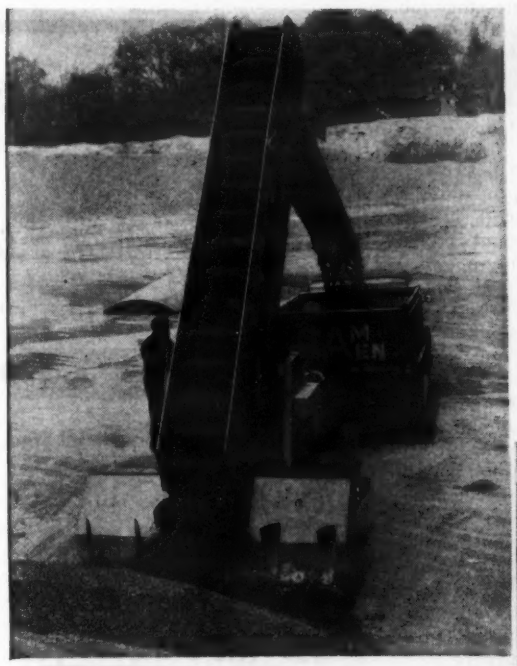
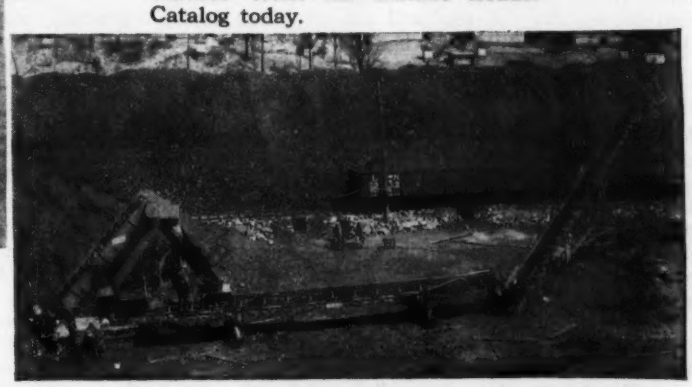


HAISS LOADER IN ACTION
(Note the full Buckets)



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Load 3 To 8 Yards Per Minute

Haiss Bucket Loaders are used for excavating — rehandling — stripping and loading: sand — gravel — stone top-soil — coal and similar materials. Self Propelled, Self Feeding — wheel or crawler mounted — One man operation. Write for Bucket Loader Catalog today.

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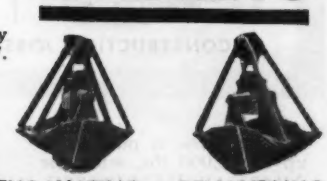
HAISS FLAT or TROUGH BELT CONVEYORS
(Model 481 and 482)
For all bulk materials. Mounted on "V" or mast truck with swivel wheels. Ask for Bulletin No. 481 for coal or coke handling—Bulletin No. 482 for sand and gravel, etc.

CAR UNLOADERS

HAISS CAR UNLOADERS
(Models 483 and 484)
Belt and drag types for low-cost undercar unloading from hopper bottom cars. Ask for bulletin No. 483-4.

•BUCKETS



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This photo shows a column joining wall sections on a General Construction Co. tilt-up job. To the right is a column after the form has been removed.

"Tilt-Up" Method Speeds Building

(*Continued from preceding page*)

purpose of the building.

It is not thought advisable to tilt ordinary concrete panels in less than 7 days after pouring, and when vermiculite concrete is used this period is extended to at least 10 days. Mr. Fulmer has on various occasions used mixes of Zonolite stabilized concrete aggregate. When this is used in conjunction with regular concrete, 6 to 8 hours are usually allowed after the Zonolite concrete has been poured before the regular concrete is poured. This gives the initial set and a surface firm enough so that the regular concrete will not go through the Zonolite to the bottom.

Forms and Reinforcing

The size of the lumber used in the forms depends upon the thickness of the panel to be poured. A light flushing oil with a viscosity of approximately 180 has been applied to prevent bond between the panel, the floor slab, and the form. However, Mr. Fulmer plans to experiment with a heavier oil with a viscosity of 240.

For reinforcing, the General Construction Co. has been using a 6-gage 6 x 6 mesh on about 90 per cent of its jobs. This is placed in the wall panel one-third the thickness of the panel from the bottom. On a single-story job, with the columns to be poured after the panel is in place, dowel pins are often used. For panels of unusual size, both vertical and horizontal reinforcing bars are used instead of a mesh. Deformed steel ⅝-inch bars are usually placed 16 inches on centers both ways, with the horizontal bars protruding 4 to 6 inches for embedment in the columns. Extra reinforcement is required when windows or other openings are in the panel.

The company most often uses a shiplap for joining the bottom of the panel and the footing, with the low side of the shiplap on the outside edge of the footing and the inside edge of the panel. This shiplap is generally made one-half the thickness of the wall panel. On a multi-story building the shiplap is used on all four sides of the panel. The company has, however, had occasion to use the key joint in place of the shiplap, at the request of a client.

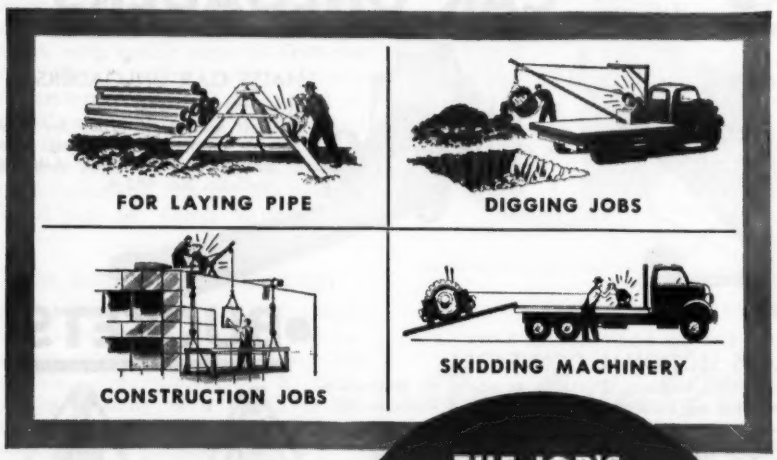
To keep the base of the panel from slipping during hoisting, it is often tied to the floor slab or the footing, sometimes with ¼-inch bars, but more often with 6-gage wire cut from 6 x 6 mesh. In work where the columns are erected first, this tie-in is not necessary, as the shiplap on the panel will make contact with the shiplap on the columns and prevent slipping.

Tilting

The lifting yoke is a steel framework which is bolted directly to the panel and into which is hooked the cable for the actual lift and tilting. For the main members the company generally uses two 6 or 8-inch I-beams joined at the top by a 10-inch; on very wide panels it is sometimes necessary to use three I-beams. A single cable and hook fasten into the top cross member for lifting. The 10-inch I beam at the top is not tied rigidly with the I-beams bolted to the panel, but is free-moving to allow play. The lifting yoke is always on the outside of the placed panel. Lately, however, the company has been using a special anchor for fastening the yoke to the panel; the anchor is sold by the Richmond Screw Anchor Co., New York City, and the Meadow Steel Products, Inc., Birmingham, Ala.

There is no set rule to follow nor need for any special hoisting equipment in doing single-story tilt-up work. Almost any kind of heavy hoisting equipment with a long enough boom will do. In order to obtain a more nearly vertical lift, the hoisting truck is on the side of the panel which will be the top.

In multi-story work the concrete columns and beams are already poured and set for the placement of two hoisting rigs. The rig on the same floor as the panel takes it up 40 to 48 inches and then the hoisting equipment on the floor above takes the load, with a continuous movement, and brings the panel to its final position.



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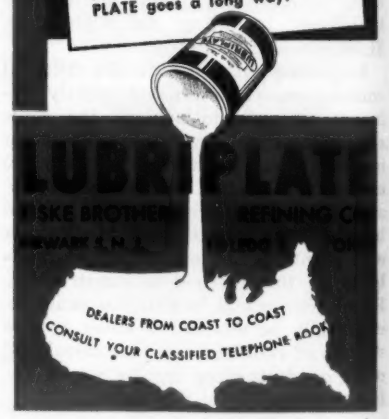

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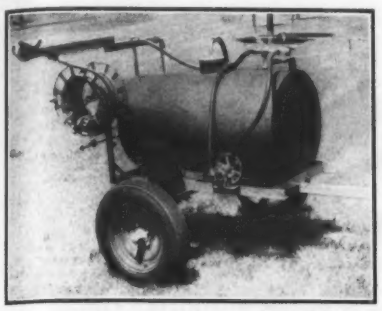


A special spray gun on the Kromer highway weed sprayer covers a distance of 30 feet. It can be raised or lowered, and can be mounted on the side of a tractor or on the cab of a truck near the operator for one-man operation.

Weed-Control Sprayer

A new sprayer for highway weed control is manufactured by the O. W. Kromer Co., 1120 Emerson Ave., N., Minneapolis 11, Minn. An important feature of the new model is the spray gun mounted on an adjustable bracket on the rear of each trailer. The gun is designed to spray a distance of 30 feet in a straight line, and to give an even distribution of chemical over the entire distance.

The gun is adjustable for raising or lowering, and can be mounted on the side of a tractor or on the cab of a truck near the operator to make it possible for one man to spray the roadside. Should the operator be unable to reach a section of roadside under a bridge or in a deep cutback, he can remove the spray gun from its holder, unreel the desired amount of hose, and spray the section, holding the gun in his hand.

Kromer highway equipment also includes a hand boom which covers a 4-foot swath. This is used along fences and for small spot spraying. To use the hand boom, the operator uncouples the hose from the Kromer spray gun and attaches the hose to the hand boom. He then reels out the desired amount of hose, opens the valve in the handle of the boom, and does his spraying.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 51.

Belt-Conveyor Bulletin

"Move More for Less" is the title of the 32-page belt-conveyor bulletin just released by Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis. It presents complete information on stationary, portable, and special-purpose belt conveyors, both troughed and flat-belt.

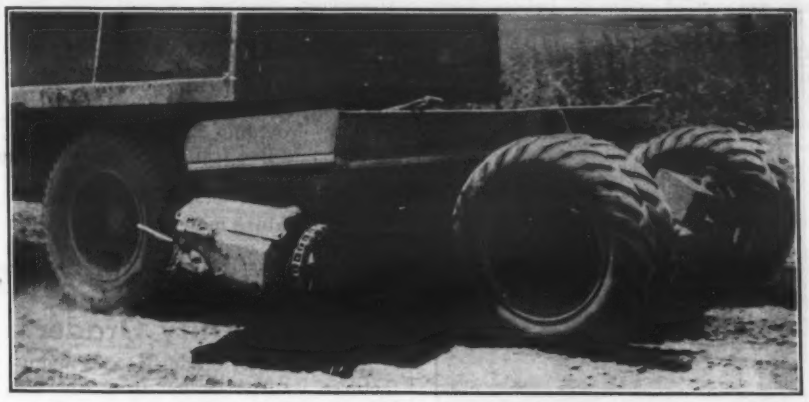
It covers applications and methods of selecting belt conveyors; dimensions, weights, and specifications for standard head, tail, and intermediate sections; lattice, channel, and timber frames; and terminal machinery.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 120.

New Cement Spreader

A new cement spreader is now being manufactured by the Hercules Steel Products Corp., Galion, Ohio, for use in soil-cement stabilization. It spreads from 5 to 10 feet in width with only minor adjustment.

The company explains that the machine is simple in operation, and that it spreads smoothly and evenly from one end to the other through the use of a single chain with cross bars which drag the cement over a tapered plate from the broad end towards the pointed end.



This new Hercules cement spreader covers 5 to 10 feet in width, in any quantities required for building soil-cement-stabilized roads or runways.

The spreader is coupled to the rear of any dump truck; when the dump body is hoisted, the cement is fed into a 10-foot hopper provided on the machine. Its wheels furnish power for distribution of cement over any width to which the machine is set. The spreader is available on a sale or rental basis.

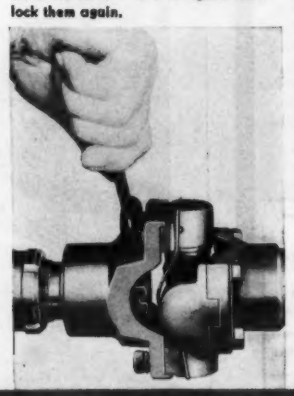
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 66.

Fifteen Minute Servicing

Car and truck manufacturers recommend that universal joints be removed, cleaned, relubricated and replaced at regular, specified intervals. The down-time required for this operation can be reduced from hours to 15 minutes — by equipping your car or truck with MECHANICS Roller Bearing UNIVERSAL JOINTS. The flange-type bearing assembly can be lifted out, simply by removing the screw bolts. Because keys and keyways are ground to fit there is no danger of destroying the original accurate alignment and balance. Let our engineers show you how this and other exclusive features of MECHANICS Roller Bearing UNIVERSAL JOINTS will give your car or truck competitive advantages.

—with a wrench

to turn down the lock plates and remove the bolts — and to tighten and lock them again.



—and a hammer

to tap the tops of the bearings lightly, to release them — and to compress the cork packing between the bearings and trunnions when the joint is reassembled.

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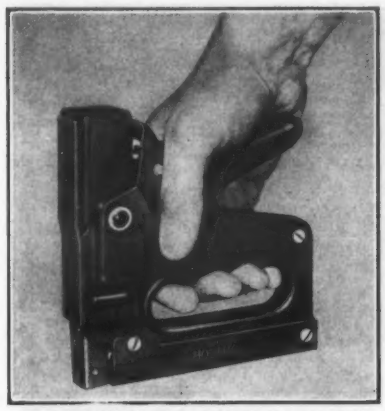


The Bostitch T-5 gun tacker, which sets staples with one-hand operation, can be used for tacking Hydron and other form lining.

Form-Lining Tacker

The T-5 gun tacker which sets staples with one-hand operation is designed for use in tacking Hydron and other concrete-form lining and similar tacking jobs. This machine, manufactured by Bostich, Inc., 1389 Mechanic St., Westerly, R. I., has a short and narrow base that permits it to drive staples within 1/16 inch of obstructions. It is easily loaded, and handles 4 staple sizes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 98.

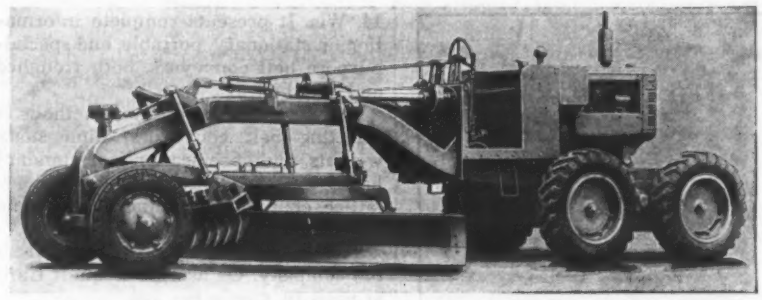
Vehicles for Snow Travel

A catalog sheet on Sno-Cats is available from the Tucker Sno-Cat Corp., Medford, Oreg. It describes their exclusive ski and track design, and points out that positive traction in all types of snow is provided by sharp propelling grouser links. All features, specifications, and prices are given for the models illustrated. There are four ski-steered models with pontoon track-drive in the rear; two double-drive models, providing four tracks instead of two; and five trailer models, including a 2-ton and a 25-seat passenger model.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 37.

Medium-Duty Grader

The new motor grader No. 303 manufactured by The Galion Iron Works & Mfg. Co., Galion, Ohio, is a medium-duty unit for highway and street construction and repair. It can be supplied with either a gasoline or diesel engine—both 45 hp at 1,600 rpm. A choice between an all-gear four-wheel tandem drive or single drive is offered. Eight overlapping forward and two reverse speeds are said to assure maximum performance of this piece of equipment under all operating conditions.



The Galion No. 303 medium-duty grader can be supplied with either a gasoline or diesel engine, with four-wheel tandem or single drive, and with manual or hydraulic booster steering. Standard equipment includes an electric starter.

Rear-tire size on the tandem drive is listed as 10:00 x 24 and on the single drive 13:00 x 20. Front-tire size is 7:00 x 20, with 10:00 x 20 available if desired. The Galion No. 303 grader can be obtained with either manual or hydraulic booster steering. Weights, without scarifier, are from 13,145 pounds (tandem drive) or 11,400 pounds (single drive) and up, depending on extra equipment.

All operations of the blade, scarifier, and leaning front wheels are completely hydraulic. The blade is adjustable 360 degrees horizontally for operation in reverse, and 90 degrees vertically for bank cutting. Standard equipment includes an electric starter.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 115.

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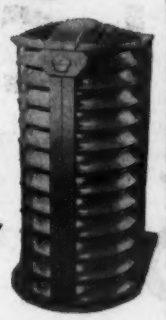

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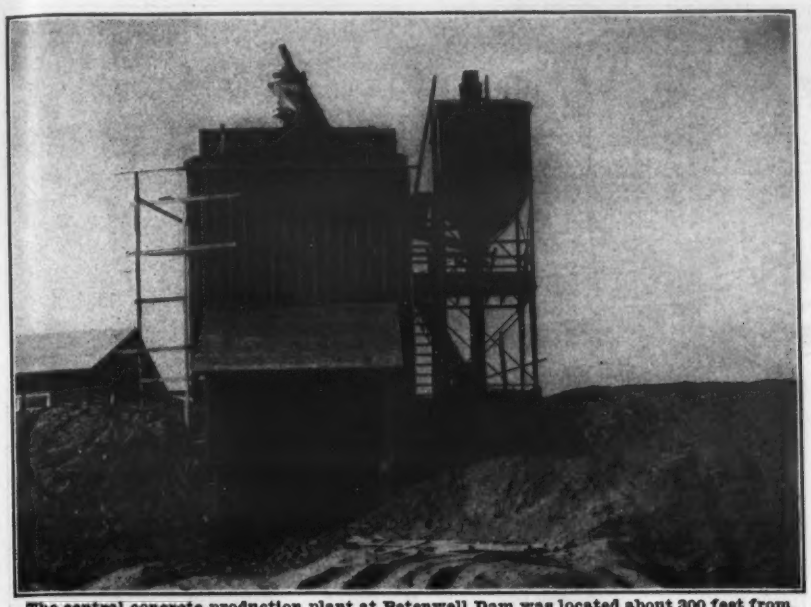

The central concrete-production plant at Petenwell Dam was located about 300 feet from the west end of the powerhouse. This photo was taken shortly after it was erected.

Dams Harness River For Power Companies

Two Dams Designed, Built By Same Forces; Concrete Pumped Up to 1,200 Feet From Central Mixing Plant

(*Photo on page 1*)

✦ ONE new hydroelectric project has been constructed and another is underway on the Wisconsin River, one of the most heavily harnessed, highly developed streams in America. Power will be distributed equally among the three companies which joined forces as the Wisconsin River Power Co. to build the dams: Consolidated Water Power & Paper Co. of Wisconsin Rapids, Wis.; The Wisconsin Public Service Corp.; and The Wisconsin Power & Light Co. —all with extensive holdings in central Wisconsin.

Petenwell Dam, the subject of this article, is located 3½ miles northeast of Necedah, Wis. With four 5,000-kva generator units installed, its estimated cost is $7,600,000 exclusive of land rights and clearing. The first generator was put into operation on July 19, 1949.

Castle Rock Dam is the other project. It is located 14 air-miles downstream, 10 miles northeast of the city of Mauston, Wis. Its construction cost, with five 3,000-kva units installed, is estimated at $6,000,000. Concreting, which was started June 6, 1949, is scheduled for completion by December 1.

Harza Engineering Co. of Chicago, Ill., designed the dams. Foley Bros. of St. Paul, Minn., and Marsch-Peterson Co. of Omaha, Nebr., contracted the earth work for both projects, and veteran construction forces of Consolidated Water Power & Paper Co. built the concrete spillways and powerhouses for both structures.

Design of Petenwell Dam

The concrete portion of Petenwell Dam is flanked by an 8,500-foot rolled-earth dam and 7½ miles of earth dikes, which required 3,750,000 cubic yards of compacted earth fill and 250,000 cubic yards of riprap surfacing. The reservoir has an elevation of 135 feet and will impound a 21,000-acre lake 15 miles long.

Overall length of the concrete dam and powerhouse, between backwalls, is 701 feet. Some 60,100 cubic yards of concrete and 3,500 tons of reinforcing steel went into these structures. The spillway is equipped with 16 Taintor gates 30 feet long and 18 feet high. Combined gate discharge capacity is 160,000 cfs. There are 4 water wheels. The powerhouse, with an operating head of 42 feet, has an installed generator capacity of 20,000 kw, an installed turbine capacity of 28,800 hp. The estimated annual output will be 102,000,000 kwh.

Construction Progress Good

Land clearing and earth work at Petenwell got under way in August, 1947. Ground water created something of a problem at first, since overburden around the spillway and powerhouse area consisted of water-bearing sand. But an extensive wellpoint system brought everything under control. In addition to 12 standard Complete wellpoint pumps with 8-inch suction and 6-inch discharge, 10 deep-well pumps of 3,000-gallon capacity each helped to hold the water table below foundation level.

Despite the nature of the site, wintertime working conditions in Wisconsin, and the shortage of materials, construction progress was exceptionally good. Concrete construction was started in May, 1948. Water was diverted through the regulating bay the following December. The spillway was in service by the end of March, concrete work was completed May 1, and the first generator was ready to go in July, 1949.

Concrete Production, Design, Control

Concrete aggregates at Petenwell Dam consisted of pit-run material truck-hauled 15 miles to the job site and processed by Sell Bros. of Appleton, Wis. Processing equipment consisted of a Lippmann Model 1236-3020 portable self-propelled crushing plant and a Lippmann portable washing and screening plant with a capacity of 120 cubic yards per hour.

(*Continued on next page*)

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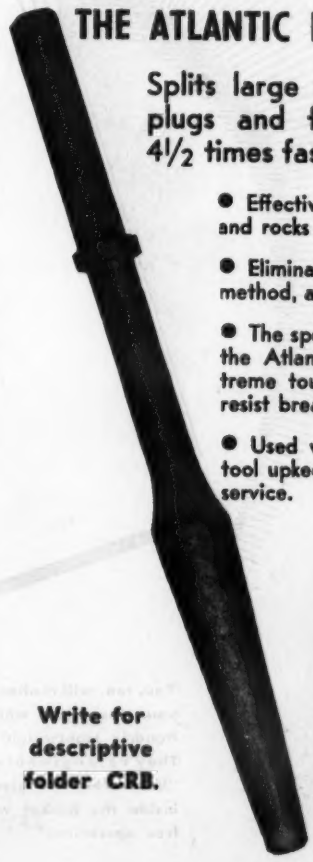

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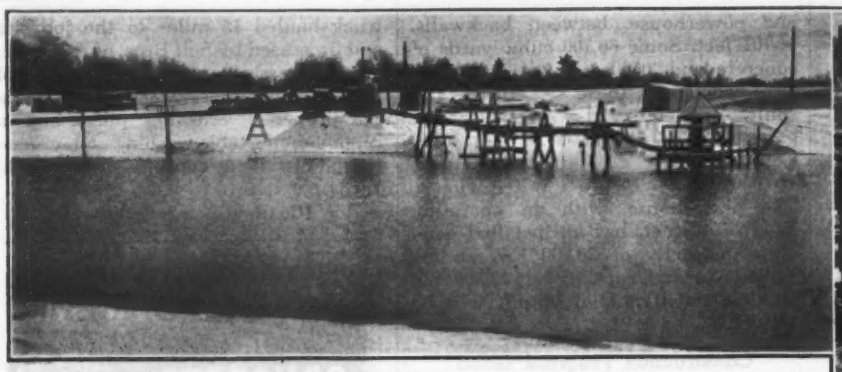
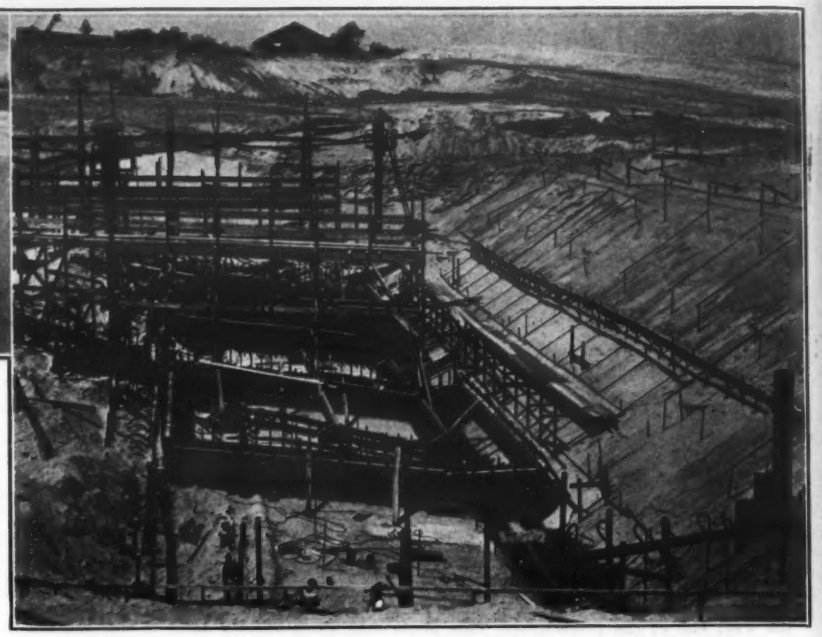




Petenwell Dam site required extensive dewatering. Above is the deep-well pump set-up at the start of dewatering operations. At right, two deep-well pumps can be seen above the scaffolding, as well as one section of the Complete wellpoint system which was used.

Dams Harness River For Power Companies

(Continued from preceding page)

Following are typical sieve and screen analyses which show the per cent passing for the two sizes of coarse aggregate and the sand:

Sand		¾-Inch Gravel		1½-Inch Gravel	
⅜-inch	100	1-inch	100	2-inch	100
No. 4	98	¾-inch	96	1½-inch	92
No. 16	71	⅜-inch	55	1-inch	55
No. 50	17	No. 4	2	¾-inch	7
No. 100	2.1				

The two sizes of coarse aggregate and the sand were stockpiled over a 72-foot-long reclaiming tunnel. A 193-foot-long 18-inch Lippmann belt conveyor elevated materials to a turnhead above a 100-ton 4-compartment Blaw-Knox bin. A cross screw conveyor from a 150-barrel bin charged the bulk-cement compartment. And a Lippmann silo supplemented cement storage facilities.

Materials were weighed in a 1-yard Blaw-Knox batcher and were mixed in two Rex 28-S plant mixers. A designated water-cement ratio was held to close tolerance by automatic weighing of all materials and frequent adjustments for varying absorption in stockpiles. An automatic dispenser added Pozzolith to the concrete in the mixers in sufficient quantity to entrain approximately 4 per cent of air. Master Builders Co., of Cleveland, Ohio, supplied both admixture and dispenser.

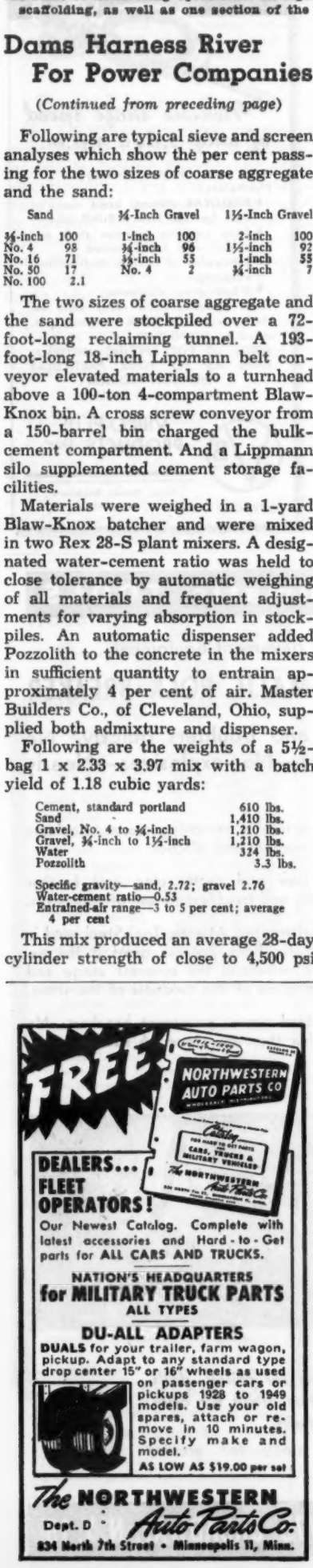
Following are the weights of a 5½-bag 1 x 2.33 x 3.97 mix with a batch yield of 1.18 cubic yards:

Cement, standard portland	610 lbs.
Sand	1,410 lbs.
Gravel, No. 4 to ¾-inch	1,210 lbs.
Gravel, ¾-inch to 1½-inch	1,210 lbs.
Water	324 lbs.
Pozzolith	3.3 lbs.

Specific gravity—sand, 2.72; gravel 2.76
Water-cement ratio—0.53
Entrained-air range—3 to 5 per cent; average 4 per cent

This mix produced an average 28-day cylinder strength of close to 4,500 psi under standard laboratory curing conditions. The average for 28-day cylinders cured in the field under simulated job conditions was lower—about 3,900 psi. Control work was carried out by inspection forces of the Harza Engineering Co., which were equipped with

(Concluded on next page)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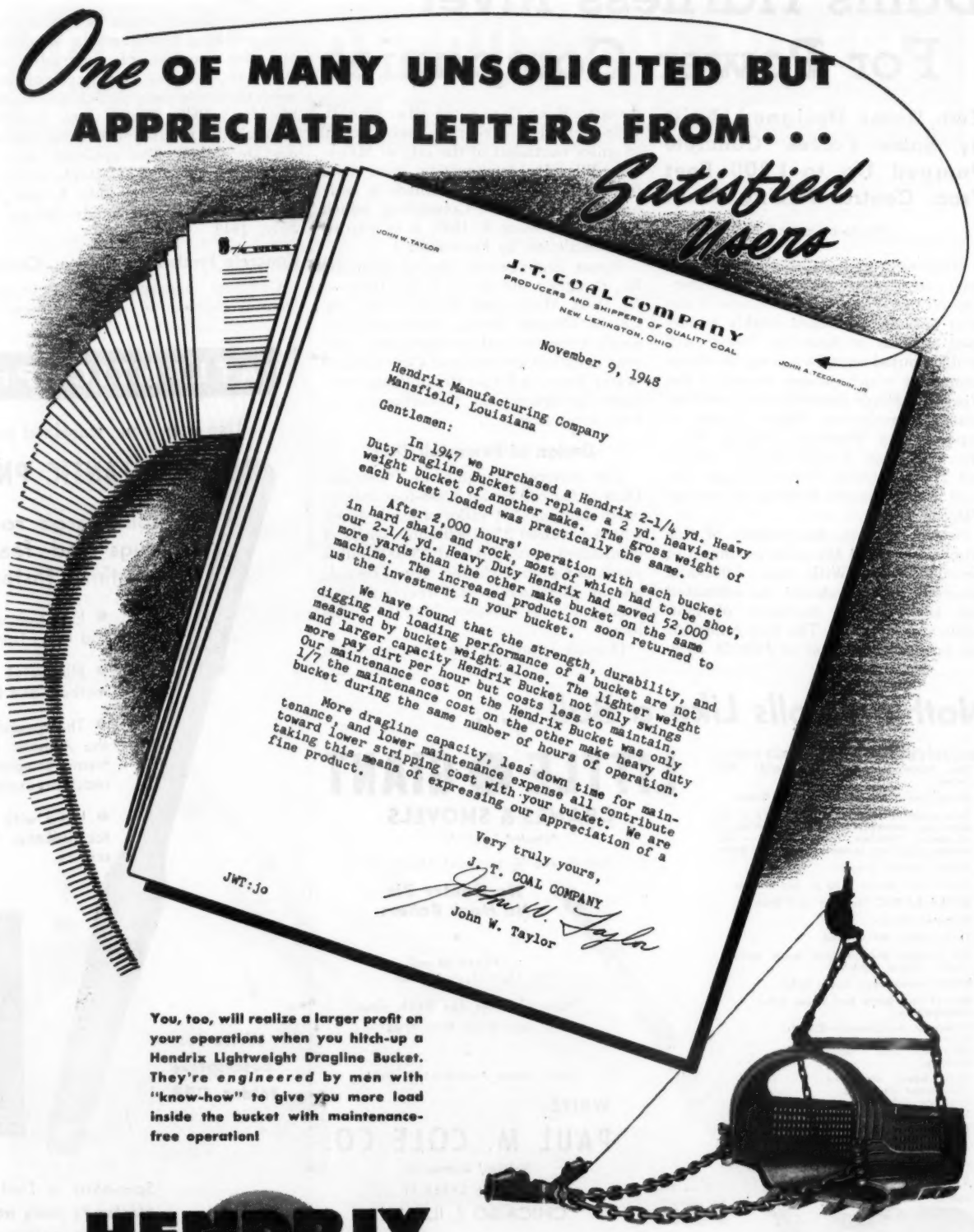
One OF MANY UNSOLICITED BUT APPRECIATED LETTERS FROM...
Satisfied Users
J. T. COAL COMPANY
PRODUCERS AND SHIPPERS OF QUALITY COAL
NEW LEXINGTON, OHIO
November 9, 1948
Hendrix Manufacturing Company
Mansfield, Louisiana
Gentlemen:
In 1947 we purchased a Hendrix 2-1/4 yd. Heavy Duty Dragline Bucket to replace a 2 yd. heavier weight bucket of another make. The gross weight of each bucket loaded was practically the same.
After 2,000 hours' operation with each bucket in hard shale and rock, most of which had to be shot, our 2-1/4 yd. Heavy Duty Hendrix had moved 52,000 more yards than the other make bucket on the same machine. The increased production soon returned to us the investment in your bucket.
We have found that the strength, durability, and digging and loading performance of a bucket are not measured by bucket weight alone. The lighter weight and larger capacity Hendrix Bucket not only swings more pay dirt per hour but costs less to maintain. Our maintenance cost on the Hendrix Bucket was only 1/7 the maintenance cost on the other make heavy duty bucket during the same number of hours of operation.
More dragline capacity, less down time for maintenance, and lower maintenance expense all contribute toward lower stripping cost with your bucket. We are taking this means of expressing our appreciation of a fine product.
Very truly yours,
J. T. COAL COMPANY
John W. Taylor
JWT:Jo
You, too, will realize a larger profit on your operations when you hitch-up a Hendrix Lightweight Dragline Bucket. They're engineered by men with "know-how" to give you more load inside the bucket with maintenance-free operation!
HENDRIX Lightweight DRAGLINE BUCKETS
For descriptive literature ask your dealer or write
HENDRIX MANUFACTURING CO., INC.
MANSFIELD — LOUISIANA

a modern field laboratory.

Mixing Capacity Stepped Up

From the mixers the concrete was discharged into the 3-cubic-yard pugmill hopper of a Rex Model 200 Double Pumpcrete to be pumped directly to the forms through 8-inch pipe lines.

Normal capacity of the 28-S mixers on a 1½-minute mix is 60 cubic yards an hour. This is in step with the Model 200 Double Pumpcrete which has a rated capacity of 50 to 60 cubic yards an hour, depending on the maximum size of coarse aggregate and the slump consistency and general mobility of an individual mix. But the concrete at Petenwell was exceptionally mobile and cohesive when held to a 3-inch slump. Consequently the Pumpcrete exceeded its rated capacity and put out 72 yards an hour when everything was clicking.

To meet this step-up in production, the mixers carried an 18 per cent overload. Also, mixing time was reduced a few seconds, since the concrete received additional mixing in the pugmill hopper of the Pumpcrete.

During operations at Petenwell, a 7-man crew ran the concrete plant. One man operated the gates in the reclaiming tunnel; another the turnhead at the top of the bins; one batcher operator handled aggregates; another the cement and admixture; there were also a Pumpcrete operator, a plant oiler who also loaded cement silos, and a plant foreman. The same plant was dismantled and moved to Castle Rock when Petenwell Dam was completed.

Concrete Distribution

The central mixing plant was located about 300 feet from the west end of the powerhouse. The maximum pumping distance from the plant to the toe of the east abutment was approximately 1,200 linear feet (the equivalent friction distance, allowing 4 to 1 for elbows and 8 to 1 for vertical lift, was over 1,400 feet). Average pumping distance was around 600 linear feet.

The concrete traveled through an 8-inch arterial pipe line and through laterals which cut off to the various points of placement. From the elevated pipe lines it was chuted or dropped through flexible tremies attached to the discharge points. It was deposited in horizontal layers shallow enough to avoid cold joints—12 inches to 4 feet, depending on the area to be covered and the nature of the forms—and was compacted by internal vibration. Transverse construction joints were spaced at 36-foot intervals, and Hydron absorptive form lining was employed on all exposed surfaces.

Scaffolding supported the arterial pipe line as well as an 8-foot runway for the passage of men and the movement of light materials and equipment. It was erected parallel to the downstream toe of the dam, and was transferred to the spillway piers after the control bay went into service.

The concrete-placing crew consisted of a foreman and 7 laborers, who vibrated concrete, handled chutes, and made all pipe changes. They also rearranged lateral pipe lines between pours unless the placing schedule was heavy; in that case, additional labor was

In the form yard at Petenwell Dam, in Wisconsin, we see forms for the ogee section being assembled in the right foreground, with the speed-ring form at left, and a section of draft tube visible in the background.

drafted to help out with major pipe changes. Discharge pipes were rigged up for non-stop pouring so that a placing rate of 450 to 500 cubic yards per 8-hour shift could be maintained when forms were available.

The Pumpcrete method of handling concrete, instead of placement by crane and bucket, was chosen on this project to reduce scaffolding requirements, eliminate considerable heavy-duty road building and maintenance, and to cut down on the number of trucks and drivers needed.

Personnel

Harza Engineering Co., which designed both projects, was represented by C. E. Wattles as Resident Engineer. Paul Kistler, Superintendent, was in charge for the earth-work contractors, Foley Bros. and Marsch-Peterson Co.

For Consolidated Water Power & Paper Co., Ralph Kutchera was Project Manager, George Marcoux was General Superintendent, Russell J. Christensen was Field Engineer, and John Drexler was General Foreman.

Equipment and Apparatus For Welding and Cutting

A 40-page catalog, with four-color photographs, presents a complete line of equipment and apparatus used in welding and cutting operations. This booklet, Form 20B, is available from the Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif. Illustrations of all equipment appear, with descriptions, specifications, and selection and application data. The booklet covers torches, tips, nozzles, fittings, attachments, regulators, and cylinder trucks.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 44.

• From the complete line of Oliver "Cletrac" Crawler Tractors and Oliver Industrial Wheel Tractors you can pick exactly the tractor you need and be assured of performance *in advance.*

The finest in industrial machinery is more than a slogan to Oliver . . . it is an accomplished fact that has been proved in year after year of outstanding performance. Design, materials, workmanship, and plant equipment are all based on one standard . . . the built-in dependability that adds up to more years of service in the field . . . lower operating and maintenance costs to you.

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CONTRACTORS
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LITERATURE
STERLING MACHINERY CORPORATION

Convention Calendar

Oct. 20-21—Virginia Highway Conference
Annual meeting, Virginia Highway Conference, Virginia Military Institute, Lexington, Va. R. P. Ellison, Executive Assistant, Virginia Department of Highways, 1221 E. Broad St., Richmond 19, Va.

Oct. 24-28—National Safety Congress
National Safety Congress and Exposition, National Safety Council, Stevens, Congress, Morrison, and Sherman Hotels, Chicago, Ill. R. L. Forney, General Secretary, National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill.

Oct. 31-Nov. 3—Steel Institute Meeting
Annual meeting, American Institute of Steel Construction, Inc., Greenbrier Hotel, White Sulphur Springs, W. Va. L. Abbett Post, Executive Vice President, 101 Park Ave., New York 17, N. Y.

Nov. 2-5—ASCE Meeting
Fall meeting, American Society of Civil Engineers, Hotel Statler, Washington, D. C. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

Nov. 7-8—ARBA Fall Conference
Fall conference on highway construction, American Road Builders' Association, Mayflower Hotel, Washington, D. C. Charles M. Upham, Engineer-Director, International Bldg., Washington 4, D. C.

Dec. 1-2—Southeastern Highway Officials
Annual meeting, Southeastern Association of State Highway Officials, Marion Hotel, Little Rock, Ark. J. Russell Henderson, Arkansas State Highway Commission, Little Rock.

Dec. 13-16—Highway Research Board
Annual meeting, Highway Research Board, National Academy of Sciences Bldg., Washington, D. C. R. W. Crum, Director, 2101 Constitution Ave., Washington 25, D. C.

Jan. 15-19, 1950—AED Meeting
Annual meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. Frank G. Knight, Executive Secretary, 360 N. Michigan Ave., Chicago 1, Ill.

Jan. 23-27, 1950—Sand & Gravel and Ready-Mixed Concrete Assns.
Thirty-fourth convention and exposition, National Sand & Gravel Association and twentieth annual convention and exposition of the National Ready-Mixed Concrete Association, Stevens Hotel, Chicago, Ill. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

Feb. 27-March 2, 1950—AGC Convention
Annual convention, Associated General Contractors of America, Inc., The Palace Hotel, San Francisco, Calif. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 6-9, 1950—ARBA Meeting
Annual meeting, American Road Builders' Association, Netherlands Plaza Hotel, Cincinnati, Ohio. Charles M. Upham, Engineer-Director, International Bldg., Washington 4, D. C.

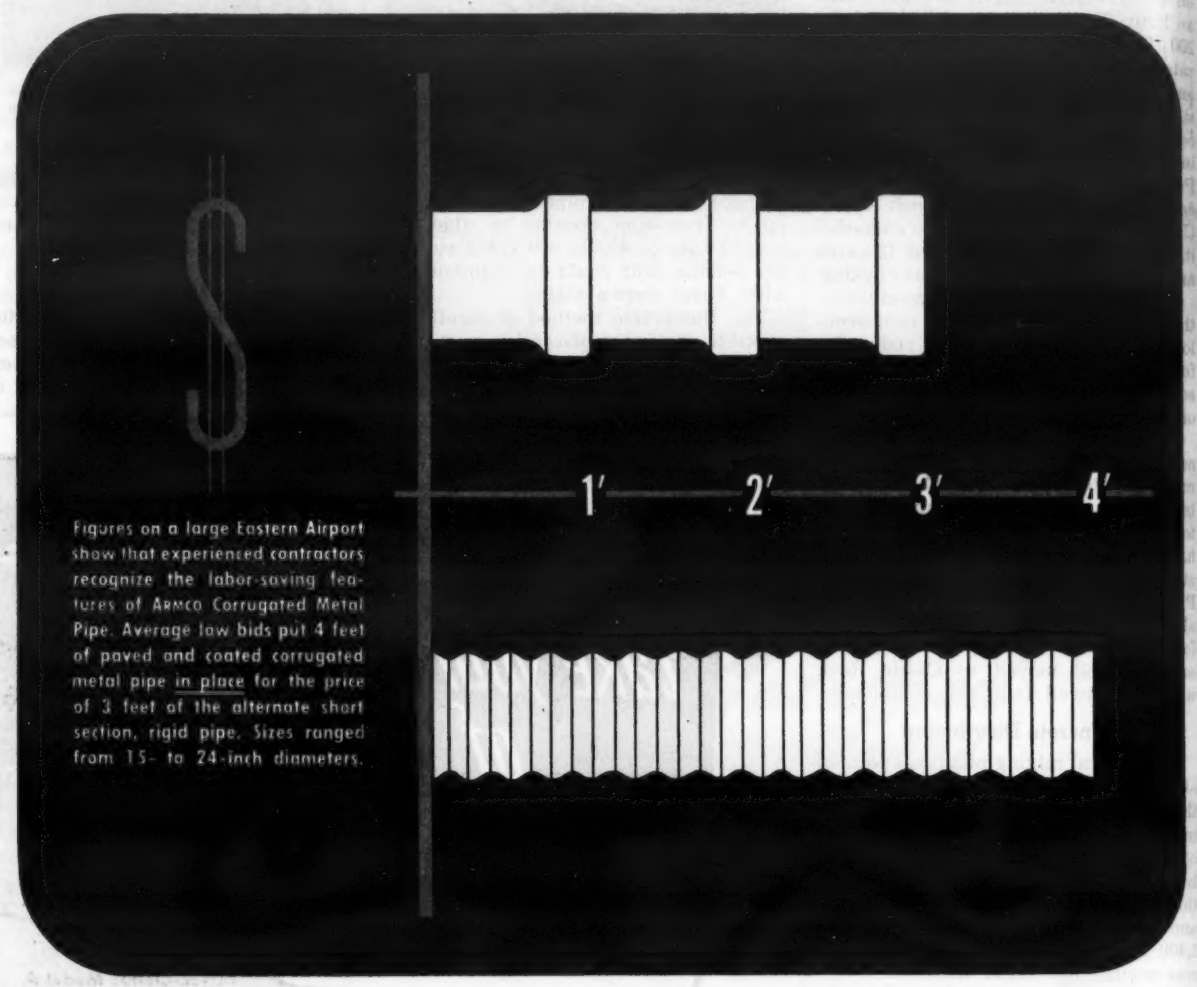
J. C. Toomey Appointed District Sales Engineer

Chain Belt Co. of Milwaukee, Wis., manufacturer of Rex and Baldwin-Rex sprocket chains, power transmission machinery, conveying, processing and concrete equipment, announces the appointment of John C. Toomey as a District Sales Engineer in the Detroit District Office. He has had special training at various company plants.

Uniform Traffic Striping Adopted in Connecticut

Double, solid lines of white paint have begun to replace the single white line at dangerous no-passing zones on Connecticut's state highways. Eventually this and other standard markings will appear on all two-lane roads in the state system says Commissioner G. Albert Hill, in accordance with the current program to provide uniform highway traffic striping across the country.

The new marking standards were agreed upon by the American Association of State Highway Officials, the Institute of Traffic Engineers, and the National Conference of Street and Highway Safety operating with a joint committee. The three agencies have brought about agreement among a number of states and are actively promoting a change-over to the new standards by the remainder.



Figures on a large Eastern Airport show that experienced contractors recognize the labor-saving features of ARMCO Corrugated Metal Pipe. Average low bids put 4 feet of paved and coated corrugated metal pipe in place for the price of 3 feet of the alternate short section, rigid pipe. Sizes ranged from 15- to 24-inch diameters.

Make your bid dollar go 33⅓% farther

Contractors have found that a dollar goes farther when they figure bids with ARMCO Corrugated Metal Pipe. It means lower bids with adequate profits and puts you in a sound competitive position.

Experience shows that ARMCO Pipe saves money in many ways. Although amply strong it often weighs only one-tenth as much as more massive types. This means low handling and hauling costs. Job costs are low because unskilled labor quickly makes the installation. There is no breakage, no curing, no waste, no delay.

Individual sections of ARMCO Pipe or PIPE-ARCH are supplied in any length that can be hauled or handled. No large and expensive equipment is required for installation. A few men with a rope sling or a small A-frame can handle the largest structure. Trenches need only be wide enough for men to work since there are no bells or massive joints that require extra digging. Connections are made with simple band couplers. End finishing is easy and inexpensive with prefabricated ARMCO End Sections.

Bid low on that next contract with ARMCO Corrugated Metal Pipe. You will find it ideal for highway, railway, airport or municipal installations. Write for complete information. Armco Drainage & Metal Products, Inc., 1465 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation

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SPECIFY STRAIGHT FRAME CONSTRUCTION
for
ALL-WEATHER "STRAIGHT THROUGH" SERVICE

Duplex Straight Frame Construction means much easier, much more dependable plow and scraper mounting!

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PROTECTED DEALER FRANCHISES AVAILABLE IN SOME AREAS

MOVING? Be sure to give us 30 days' notice of your change of address—and let us have your old as well as your new address.

Unless you do this you may skip an issue or two before the correction is made—and you won't want to be missing any issues of CONTRACTORS & ENGINEERS MONTHLY these days!

CONTRACTORS AND ENGINEERS MONTHLY
470 Fourth Ave., New York 16, N.Y.

Because of its light weight, 4¾ pounds, the Sterling Century electric sander can be used in any position.

Hand Electric Sander

The Century, a completely new portable electric sander, has been introduced by Sterling Tool Products Co., 1340 N. Milwaukee Ave., Chicago 22, Ill. It weighs 4¾ pounds and features a non-stalling high-speed motor encased in a die-cast aluminum housing.

The Century is 4 x 9 x 3 inches and fits into the hand easily. It uses one-third of a standard abrasive sheet, and several sheets of paper can be loaded at one time. The series-wound motor is of the universal ac-dc type and is said to give a 5,000-rpm pad speed. The company states that the sander's simple operating mechanism permits easy servicing in the field.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 58.

Tracing Reproductions

Two catalogs on the Lithoprint and Lithco processes for the reproduction of drawings and tracings are available from the Lithoprint Co. of New York, Inc., 145 Hudson St., New York 13, N. Y. Catalog No. 32 is titled "Map Reproduction" and Catalog No. 34, "Duplicate Tracings".

The folders explain that Lithoprints are made on tracing cloth, white cloth, various grades of tracing paper, drawing paper, or cloth-backed paper. Copies are usually made the same size as the tracing, opaque drawing, or map, although reductions and enlargements can also be made. The catalogs illustrate that unmarred Lithoprints, and blueprints from them, can be made from originals that have cracks, dirt marks, or soiled portions.

The Lithco tracings are said to give the appearance of hand-drawn ink tracings even when made from pencil originals.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 82.

Engine Replacement Package

A plan to merchandise the new Reo Gold Comet gasoline truck engine as a replacement power plant for trucks, regardless of make, was announced recently by Reo Motors, Inc., Lansing 20, Mich. The program will be handled through the service departments of Reo's branches, distributors, and dealers.

The engine package will include, in addition to the engine assembly, a fan assembly, generator, oil filter, starter, coil, spark plugs, carburetor, governor, air cleaner, fuel pump, distributor, front cross member, engine mountings (both front and rear), muffler, tail pipe, and exhaust pipe.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

Public Roads Shifted To Commerce Department

The Senate recently approved the Presidential Reorganization Plan Number 7 which transfers the Public Roads Administration to the Department of Commerce. Under previous legislation the PRA had just recently been transferred to the newly created General Services Administration. This action re-transfers PRA to the Department of Commerce.

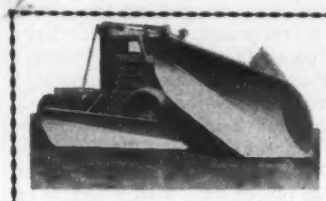
Opposition to this transfer was led by Senator Hayden (D.) of Arizona who has been long identified as a legislative leader in highway matters. Senator Hayden argued that the President's recommendation was irregular because of previous action of the Congress in transferring PRA to the General Services Administration. In rebuttal to this, Senator Myers (D.) of Pennsylvania pointed out that an opinion of the Attorney General transmitted to the Senate held that the move was legal despite the intervening legislative action which had been taken by the Congress.

Senator Hayden then insisted that the Hoover Commission, when it recommended the transfer of the PRA to the Department of Commerce, was misinformed in believing that the PRA was a transportation agency. Senator Hayden maintained that the PRA was a "construction agency" as distinguished from a transportation agency and as such had no place in the Department of Commerce.

Despite Senator Hayden's plea, the plan was passed by a margin of 9 votes.

Loux Made Tubing Manager

The Flexible Tubing Corp., Branford, Conn., maker of Spiratube flexible tubing, announced recently the appointment of A. H. Loux as Manager of Distributor Sales for the company.



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That goes for snow clearance, too. It's no mere accident that

DAVENPORT-FRINK SNO-PLOWS

enjoy engineer-preference throughout the snow belt. They have won their spurs through Faster • Safer • Cleaner Snow Removal.

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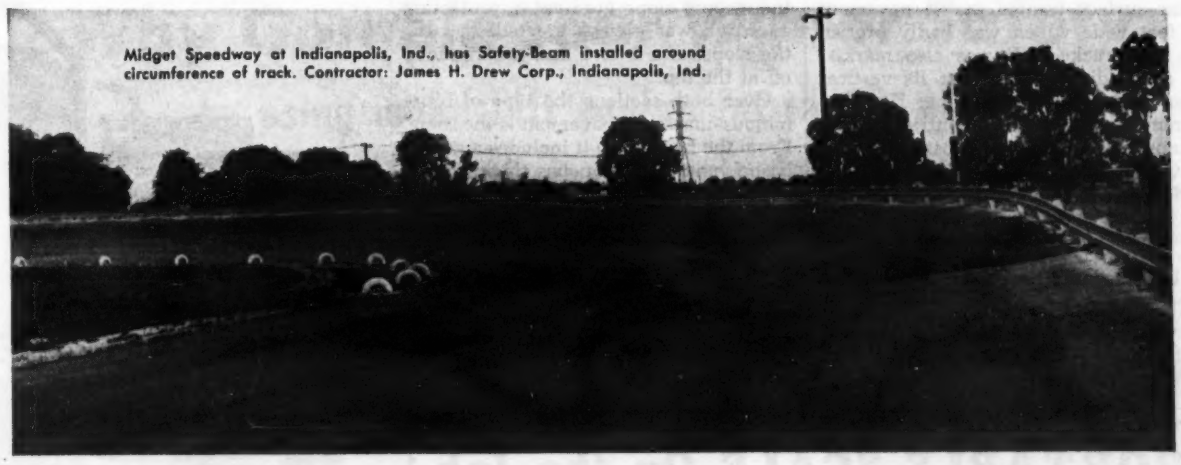
ALL SIZES and TYPES for TRUCKS • TRACTORS • MOTOR PATROLS

DAVENPORT BESLER CORP.

Dept. A. Davenport, Iowa

Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK

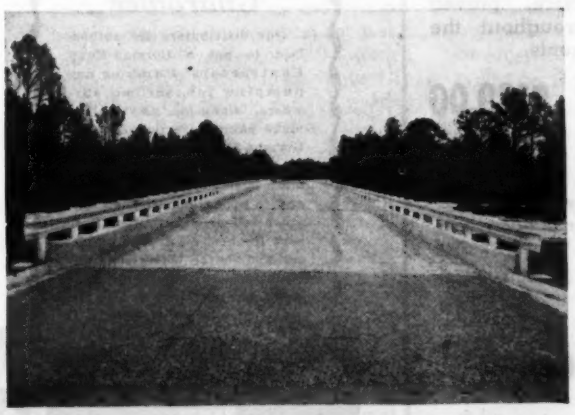


Midget Speedway at Indianapolis, Ind., has Safety-Beam installed around circumference of track. Contractor: James H. Drew Corp., Indianapolis, Ind.

WHERE DANGER LURKS...

THAT'S THE PLACE FOR SAFETY-BEAM

Safety-Beam installed on new approach to famous Pulaski Skyway, near Newark, N. J. Contractor: S. J. Groves & Sons Co., Woodbridge, N. J.



Safety-Beam protects motorists using this bridge on Glenville-Baxley Road, in Georgia. Contractor: Scott Construction Co., Thomasville, Ga.

Wherever there's a danger point along a highway — a sharp turn, embankment, bridge approach or other source of hazard — that's the place for Bethlehem Safety-Beam Guard Rail.

Bethlehem Safety-Beam Guard Rail is ideal for protecting traffic because of its strength and ability to absorb impact. The rail consists of heavy sections of steel plate in a channel-type design, bolted together on either steel or wood posts to form a continuous, impact-absorbing beam. What happens when a vehicle strikes Safety-Beam? Impact is absorbed by several adjacent posts, rather than one post, thus making it next to impossible for the vehicle to break through the rail.

Safety-Beam Guard Rail is easily visible day and night. It normally comes in 12 ft, 6 in. lengths, but is also furnished in lengths up to 50 ft. It can be installed economically, even by unskilled labor, for it fastens to the post with only one bolt. No end anchor rods, special tools or complicated adjustments are required.

Folder 545 shows standard details and assembly plans for Bethlehem Safety-Beam Guard Rail. Write for a copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail Posts
Bar Mats • Guard Rail • Wire Rope and Strand
Hollow Drill Steel • Spikes • Bolts and Nuts • Pipe
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Timber Bridge Hardware • Tie-Rods

BETHLEHEM STEEL

Road Rebuilt With Bituminous Macadam

Three-Inch Surface Course Machine-Placed on One-Inch Gravel Leveling Course; Gravel Base Foundation

✦ STATE Route 111 in York County, southeastern Maine, has been reconstructed for 6.33 miles from its intersection with U. S. 1 in Biddeford, westerly to its intersection with State Route 35. This well traveled highway is one of the popular routes for traffic entering Maine from New Hampshire. At Alfred, 5 miles beyond the westerly end of the project, the state route joins U. S. 202. State Route 111 also connects with the Maine Turnpike toll road just west of Biddeford, where it passes over the Turnpike on a grade-separation structure.

The existing road was black-top, with a tar-surface-treated gravel pavement 20 feet wide which was badly broken up and cracked. It was also marked by sharp dips and rises in its vertical alignment. The Maine State Highway Commission awarded a contract for its reconstruction to Frank Rossi, a Gardiner, Maine, contractor, on his low bid of $325,919.20. Work got under way in July, 1948, and the job was scheduled for completion this past summer.

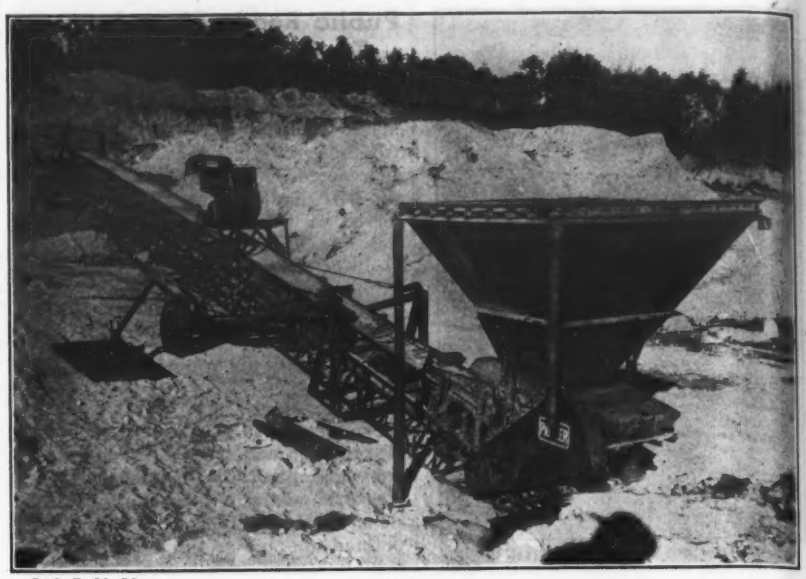
Urban and Non-Urban Sections

The 6.33-mile project was divided into two sections, both of which received Federal Aid. The first, or urban, section at the eastern end of the improvement is ¾ mile in length, and runs through the city of Biddeford. Here the pavement is 38 to 40 feet wide between the 18-inch-high granite curbs which have a 6-inch-high exposed face. The gravel base supporting the pavement is a foot wider on each side than the surface, since it extends out beneath the curbing on each side. On one side of the street is a 4-foot-wide sidewalk consisting of a 2-inch course of bituminous concrete on a 6-inch gravel base. On the other side a 2-inch layer of sod was placed on a 4-inch course of loam.

In the non-urban section making up the remainder of the project, the pavement is 22 feet wide with a 3-inch center crown, and is flanked by 8-foot shoulders with a slope of ¾ inch to the foot. In the fill sections the side slopes are either 4 to 1 or 1¾ to 1; in sections with the steeper slope gradient, a protecting guardrail was always erected. In cuts, the slopes are 2 to 1 and are rounded off at the top.

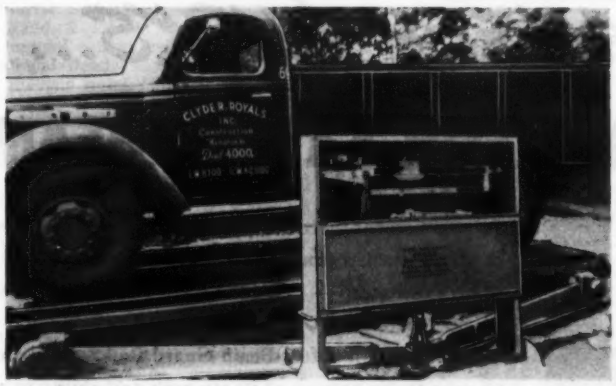
Over both sections the type of bituminous-macadam pavement is the same. From the bottom up it includes a gravel base from 18 to 30 inches thick; in the non-urban portion of the contract this base extends out through the shoulders with a depth of at least 6 inches. Next comes a 1-inch gravel leveling course which was given a shot of tar and then covered with the 3-inch bituminous-macadam surface course. The inner 2 feet of shoulders on each side were also

(*Continued on next page*)



C. & E. M. Photo
Gravel for the leveling course on the Rossi contract is screened in the borrow pit by this Pioneer portable screening plant.

PORTABLE SCALE *On the Job*



Scale in use by C. R. Royals, Contractor on Road job in Virginia.

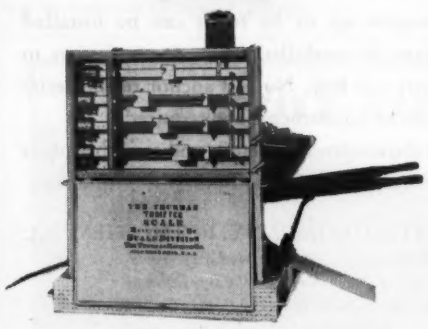
A TYPICAL INSTALLATION of a Thurman Portable Truck Scale, which was moved to present location in one unit. The Thurman Portable Truck Scale meets the need of the contractor who wishes to move from one job site to another, quickly and economically.

Extra large steel bases support scale so it can be placed on firm ground—requires no concrete footings nor timbers.

An accurate, sturdy and dependable scale built to the rigid requirements of the U. S. Bureau of Standards.

CAPACITIES FROM 18-30 Tons **DECK SIZE 18'-30'**

WHEELBARROW SCALES



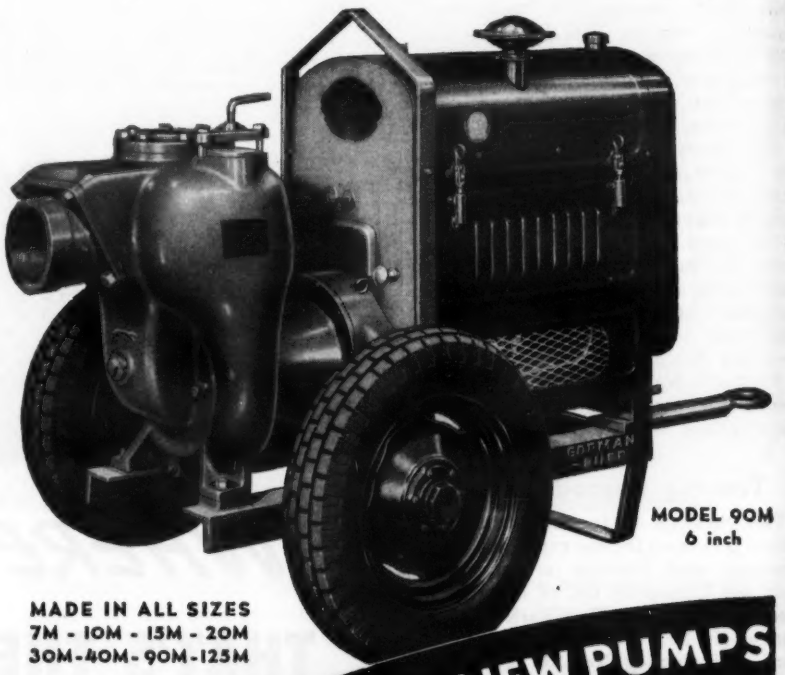
The Thurman Wheelbarrow Scales are built for years of trouble-free service, proven through use throughout the American continents.

2—Beam Model 500 Pound Capacity **$189.00**

3—Beam Model 500 Pound Capacity **$198.00**

All scales are sold F.O.B. Columbus, Ohio, with unconditional factory guarantee and are fully backed by your distributor.

SCALE DIVISION
THE THURMAN MACHINE CO.
156 North Fifth Street
Columbus, Ohio Established 1918



MODEL 90M
6 inch

MADE IN ALL SIZES
7M - 10M - 15M - 20M
30M-40M-90M-125M

GORMAN-RUPP'S NEW PUMPS

CHALLENGE ANY PUMP TO MATCH THEIR PERFORMANCE

With a new complete line of Contractors' Pumps, Gorman-Rupp has topped their own past high record of performance with a better pump --

-- **QUICKEST PRIMING**
-- **HIGHEST PRIMING**
-- **PUMPS MORE DIRTY WATER**

Compare them for priming speed:

The new Model 15M (3″) primes at 25 ft. suction lift in 61 seconds.

The new Model 90M (6″) primes at 25 ft. suction lift in 44 seconds.

And the Gorman-Rupp is still the most simple pump --

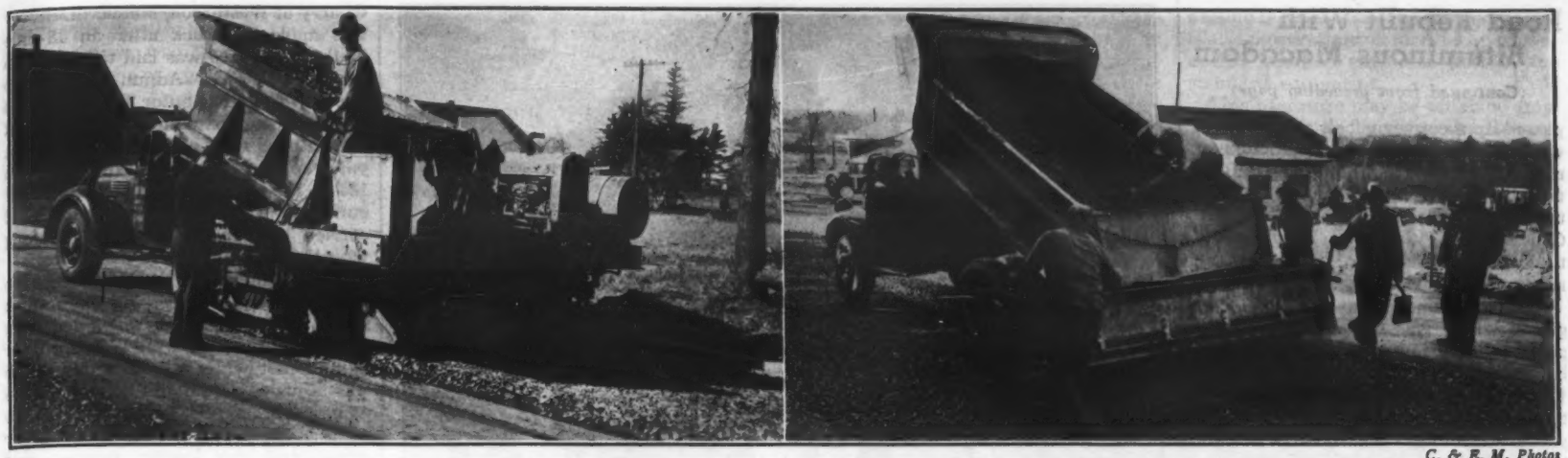
No ports, no valves, no clean-out plates, nothing to cause stoppages.

Write for the new Contractor's Bulletin 8-CP-11

THE GORMAN-RUPP *Guarantee*

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, anytime, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO



C. & E. M. Photos

An Adnun Black Top Paver (left) lays a 9-foot lane of macadam No. 2 stone on an urban section of Maine State Route 111. Above, on another section a second application of stone chips is put down with a Hi-Way spreader box adjusted for an 8-foot-wide lane.

given a tar treatment, making the black-top 26 feet wide in the non-urban section.

An exception to this paving pattern was made at the intersection of State Route 111 with U. S. 1 at the town square in Biddeford. Two courses of bituminous concrete, one inch each, were laid over the old concrete in this area because of the heavy traffic over the Federal route. They were laid after the old pavement had been leveled with a layer of the same material then on the surface.

Grading

The horizontal alignment of the old road was satisfactory, so it was followed in the improvement. The sharp breaking curves in the profile, however, were leveled off. The cuts and fills averaged only between 4 and 5 feet. About 5,000 cubic yards of ledge rock was encountered and was removed with blasting. Holes were drilled with a Chicago Pneumatic wagon drill, and three Ingersoll-Rand Jackhamers, powered by a CP 500-cfm air compressor. The old surface-treated pavement was dug out with shovels and hauled away in trucks for use on the fills. Three shovels saw service—two ¾-yard units, a Northwest and a Lima Paymaster, and a Bay City Model 65 1¼-yard shovel. Hauling was done with five Dodge 5-yard trucks owned by the contractor, and several hired trucks.

In four cuts it was found more efficient to use a LeTourneau 12 to 15-yard Carryall pulled by a Caterpillar D8 tractor. Also employed in the grading operations were three tractor-dozers—two D8's and a D4. While the earth-work operations were in progress, the contractor was also laying some 3,500 linear feet of underdrain. The pipe was asphalt-coated corrugated metal, 6-inch to 12-inch diameter.

As the grading progressed, the shovels were moved from the roadbed excavation to the gravel and borrow pits; there were four of these strung out along the sides of the highway. Usually only two shovels worked the gravel or borrow pits, with a total of eight trucks hauling the material. The 18-inch-minimum gravel base course was spread in two lifts. When necessary, water was added from a 1,000-gallon trailer tank which had a spraybar at the rear and was pulled by one of the trucks. Traffic traveled the road during the laying of the gravel, and assisted the hauling trucks in the compaction. In the urban section the granite curb was then set in place.

Leveling Course

On top of the foundation of gravel, a 1-inch leveling course of screened gravel was laid with material passing the 1¼-inch sieve. A Pioneer portable screening plant was set up in the borrow pit. One of the shovels loaded the receiving hopper, and the material

(*Continued on next page*)

BACK-RIP SCARIFIER

RIPS in your dead-head time when backing for new load.

BACK-RIPPING Saves Contractors TIME, MONEY and EQUIPMENT.

Hinged tooth assemblies mount on back of Bulldozer moldboards.

SWINGS FREE WHEN DOZING

SMALL EQUIPMENT COMPANY
816 North La Cienega Blvd.
LOS ANGELES 46, CALIFORNIA

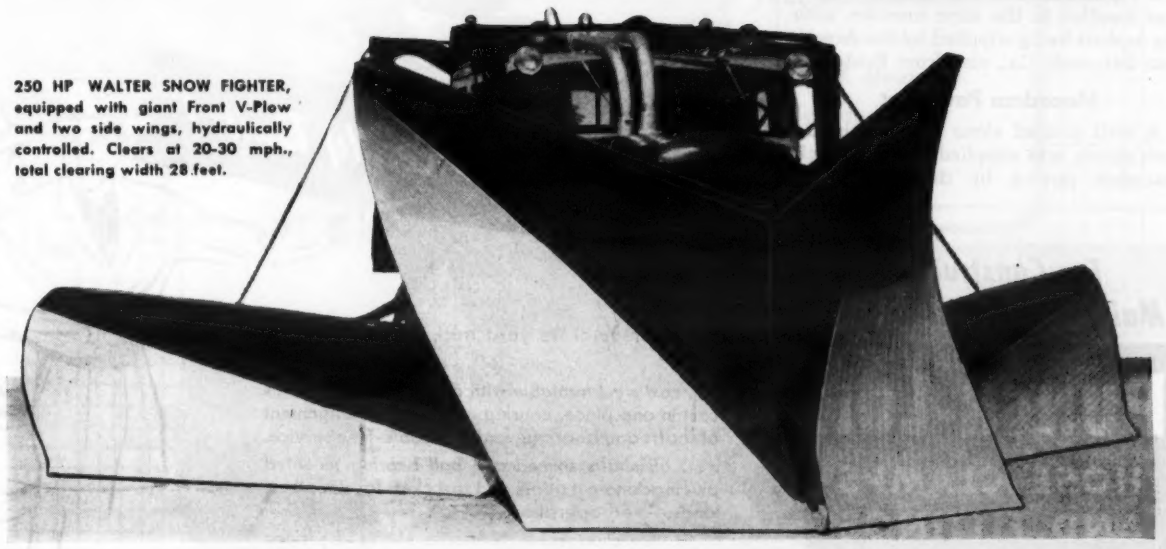
Why Gamble Your Winter Safety

by using makeshift equipment that is slow, hard to control, inadequate for the job?

For Fast High-Capacity, Unfailing Snow Removal

no equipment approaches specially-designed

WALTER
4-POINT POSITIVE DRIVE
SNOW FIGHTERS



250 HP WALTER SNOW FIGHTER, equipped with giant Front V-Plow and two side wings, hydraulically controlled. Clears at 20-30 mph., total clearing width 28 feet.

THE way to judge modern, efficient snow fighting equipment is in speed of plowing—miles covered per hour—control of direction with plows and wings—ability to widen and cut down snowbanks—power to blast through drifts—rugged reserve to keep going day and night, until the job is done. Obviously, auxiliary equipment designed for other purposes, falls far short of these requirements.

In contrast—big, powerful, rugged Walter Snow Fighters are specially designed in every detail for efficient, speedy snow removal and ice control. They clear at 20-30 mph., are powered from 150 to 250 hp., provide up to 42,000 lb. gvw., may be equipped with a great variety of correctly designed plows, wings, scrapers, controls, bodies, sand and chemical spreaders, etc.

Only Walter Snow Fighters bring you the vital Four-Point Positive Drive to maintain 100% traction and keep going when other equipment is stalled. Only Walters have the special construction to stand up for years in the most gruelling operation. Only Walters are built on 30 years' specialized experience with every conceivable problem of snow removal. Have our dealer show you the latest Walter Snow Fighters. Let our engineers help you with your problems.

Record Snow Clearance is "old stuff" to Walter Snow Fighters

As far back as 20 years ago, the Greyhound Bus Lines used a fleet of 11 Walter Snow Fighters to keep 4,000 miles of highway open during a severe blizzard in the worst snow belt of the Great Lakes area. In this several day period, the longest tie-up of any stretch of road, was 36 hours! And it was done with the old-time Walter Snow Fighters—forerunners to today's big, powerful units.

WALTER MOTOR TRUCK CO. 1001-19 Irving Ave. Ridgewood 27, Queens, L. I., N. Y.

Road Rebuilt With Bituminous Macadam

(*Continued from preceding page*)

passed up a conveyor belt at the end of which two trucks were positioned at right angles to each other. The tailings that did not pass the screen fell into one truck and were returned to the pit. Gravel passing the screen dropped into the other truck and was hauled to the road.

The trucks end-dumped the screened gravel which was spread by a Caterpillar No. 112 motor grader and rolled by a Buffalo-Springfield three-wheel 12-ton roller. The screening plant turned out the gravel at the rate of 80 yards an hour. This course trued up the roadbed and produced an even surface to receive the stone for the macadam pavement.

Before any stone was placed, however, the leveling course was given two shots of T-5 tar in applications of 0.4 gallon and 0.2 gallon to the square yard respectively. Each tar application was covered with a choke course of gravel passing the ¾-inch screen and worked in by pulling a broom drag over the surface. The gravel was put on from the tail-gates of trucks through a Hi-Way spreader box. The broom drag, which was pulled by a truck, consisted of a 12-foot-square wooden frame made from 2 x 6's. It carried three rows of fiber brooms, one at each end and another in the middle. Each row was made up of six individual hand brooms with the handles removed, of course. The drag was pulled with a corner hitch so that it moved diagonally over the road.

The emulsified asphalt for the job was applied by Edward Emory of Sanford, Maine, with a Kinney 1,000-gallon distributor mounted on a GMC truck. Koppers tar was shipped in tank cars from Boston, Mass., to a siding of the Boston & Maine Railroad in Biddeford. From there it was transferred to a distributor and applied to the leveling course by the Koppers Co. The emulsified asphalt used in the macadam work was handled in the same manner, with the asphalt being supplied by the American Bitumuls Co., also from Boston.

Macadam Pavement

A well graded stone passing the 2-inch screen was supplied for the 3-inch macadam paving by the Blue Rock Quarry of Westbrook, Maine. Delivery was made by truck after an 18-mile haul. The stone was laid to a uniform thickness by an Adnun Black Top Paver. The distributor then gave the course a shot of emulsified asphalt at the rate of 0.75 gallon to the square yard, applied at a temperature of from 125 to 135 degrees F. The face of the curb was protected with a metal shield carried by a man who walked along with the operator of the distributor.

The bitumen was then covered with a layer of keystone passing the ¾-inch screen. The stone was tail-gated from the trucks through a Hi-Way spreader box 11 feet wide, although this width was adjusted to suit the width of lane being covered. The keystone filled the voids in the 3-inch course of the larger stone, and the keying process was furthered, first by broom-dragging the

(*Concluded on next page*)

C. & E. M. Photo

Pete Verili, at left, was General Foreman on the Maine job. Next to him is Frank N. Rossi, Superintendent, and his father, Contractor Frank Rossi. Frank Wright was Project Engineer and Don Casler was his assistant.

What other ⅜ or ½ yard truck shovel has *all* these features?

. . . *cast steel turntable* with deck and side-frames cast in one piece, insuring constant true alignment of shafts and bearings, longer trouble-free service.

. . . *all shafts splined and ball bearing mounted* plus machine-cut gears and sprockets for smoother, longer-lived operation.

. . . *interchangeable turntable shafts, bearings and clutches.*

. . . *tapered hook rollers, ball-bearing mounted,* easily adjustable for wear.

. . . *air-ram operated clutches* that are fingertip controlled—that are fast, positive, dependable.

From wheels to boom-point you get *more* fast-production, cost-cutting features in a MICHIGAN. That's why I selected MICHIGAN . . . and it's why I say *you'll get the most for your money in a MICHIGAN!"*

Write for your copy of Bulletin 100, "On the Job with MICHIGAN," showing MICHIGAN Truck Shovels on jobs like yours.

DID YOU KNOW
you can buy
a brand new
MICHIGAN
TRUCK CRANE
complete with chassis
for as little as $10,250
F.O.B. factory?

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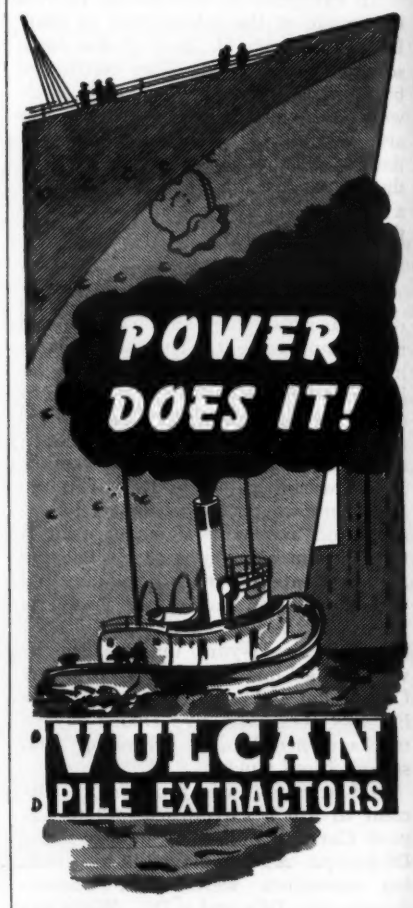
MICHIGAN POWER SHOVEL COMPANY
490 Second Street, Benton Harbor, Michigan, U.S.A.



• Every minute on the job, the efficient, dependable Vulcan Pile Extractor produces power that pulls piles rapidly and economically, even under the most adverse conditions. Its effectiveness and durability have been proved through two decades of heavy duty service.

The Vulcan Pile Extractor is manufactured in three sizes for all extracting purposes—No. 200 for pulling less difficult piles, No. 400 for pulling small wood piles and commonly used lengths and sizes of steel sheet piles driven under normal conditions, and No. 800 for extracting the heaviest, longest and most difficult steel piles and all size or length of wood, concrete, H-beam or pipe piles.

Get complete details on the time-saving Vulcan Pile Extractor. Write today.

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For Construction Maintenance and Repairs

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HOSE CLAMPS AND FITTINGS

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Dept. A, 321 N. Justine St., Chicago 7, Ill.

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surface, and second by compacting the stone with the 3-wheel 12-ton roller. More bitumen was then applied, this time at the rate of a gallon to the square yard, and the broom-drag treatment was repeated.

In this way the macadam was laid the full width, while traffic was kept off the side being constructed until the stone had fully bonded together. Any loose stone was then swept from the surface by a Grace power broom pulled by a pick-up truck. The macadam was next sealed with two shots of emulsified asphalt, each applied at the same rate—0.3 gallon to the square yard. Each application was covered with stone chips passing the ½-inch screen. The seal coat, both bitumen and stone, was put on usually in 10 and 12-foot lanes so as to lap over the center joint in the macadam underneath.

The gradation of the three different sizes of stone used in the macadam course was as follows:

Sieve Size	Per Cent Passing		
	Macadam No. 2 Stone	Keystone	Stone Chips
3-inch	95–100	....	....
1½-inch	0–15	95–100	....
¾-inch	....	0–15	95–100
No. 4	....	....	0–15

Quantities and Personnel

By the end of the 1948 construction season, the urban section of highway through Biddeford was completed. In the non-urban or rural section, the grading, base, and tarred-gravel leveling course were also finished before winter set in (except for a short stretch of less than a mile at the farther end), thus providing a full-width suitable surface for traffic. Last summer the contract was completed with the laying of the remainder of the macadam surface.

The major items on the 6.33-mile contract included the following:

Earth excavation	70,000 cu. yds.
Rock excavation	5,000 cu. yds.
Borrow	51,000 cu. yds.
Gravel base	60,000 cu. yds.
Surface-treated gravel leveling course	3,800 cu. yds.
Tar	45,000 gals.
Bituminous-macadam surface course	7,200 cu. yds.
Emulsified asphalt	225,000 gals.

Contractor Frank Rossi employed an average force of 50 on the project under the direction of his son, Frank N. Rossi, Superintendent, and Pete Verile, General Foreman.

For the Maine State Highway Commission Frank V. Wright was Project Engineer, assisted by Don Casler. The Commission is headed by Lucius D. Barrows, Chief Engineer. Ernest L. Merrill is Principal Highway Engineer, and R. Morrell Page is Assistant Highway Engineer.

Wire-Rope Swivel

A new type of wire-rope swivel that has double roller bearings and will swivel under full load has recently been developed by Flexo Machines Co., 456 N. Aberdeen St., Chicago 22, Ill. Some of its features are: both thrust and radial roller bearings, streamlined body, permanent lubrication, and replaceable parts. The swivel is offered in five sizes: for ½, ⅝, ¾, 1, and 1½-inch wire rope. It can be had with eye-bolt, hook-bolt, integral-eye, or clevis-type ends.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 38.

Midwest Reo Salesman

The appointment of N. P. Greenbaun as District Representative for Michigan, Indiana, and parts of Illinois and Kentucky has been announced by Reo Motors, Inc., Lansing, Mich. Associated with the trucking industry since 1925, Mr. Greenbaun formerly was truck and fleet sales manager in the Indianapolis district for the Ford Motor Co. Prior to joining Ford, he was a truck and bus specialist for the Socony Vacuum Oil Co., and was employed by General Motors in sales and service.

Pneumatic-Tire Rollers

A 3-color folder on pneumatic-tire rollers, both the straight and the Wobble Wheel with oscillating action, is presented by Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S. E., Minneapolis 14, Minn. Photographs and drawings illustrate the models. Special attention is paid to the kneading and semi-vibration action obtained with the Wobble-Wheel. Specifications and results of tests using Bros rollers are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 63.

Truck-Mounted Drill

The McCarthy vertical drill, for use on a 1½-ton or larger truck, is described in a catalog put out by The Salem Tool Co., 769 S. Ellsworth Ave., Salem, Ohio. Specifications, features, and photographs of the drill are given.

Salem Hercules hard-surfaced spiral augers or rods for use with the drill are made in 6-foot lengths and in 6 and 8-inch diameters. When the machine is in place for drilling, two individually operated jacks are set to take the strain from the truck springs, and level the machine. The derrick is raised and lowered by hydraulic power. A hydraulic feed and lift for rods and booms is also power-controlled. A 60 hp water-cooled gasoline engine is part of the standard equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 143.

WINTER JOBS AT SUMMER SPEED

Aeroil Oil Burning Portable Water Heaters (210C), Concrete Mixer Heaters (208C), Salamanders (212-C), Steam Thawing Outfits (277C), Thawing Torches (294C), and Ground Thawers (287C) chase Jack Frost off winter construction jobs. All equipment listed above is portable, kerosene fired and easily operated by inexperienced help. No need for delays, shut-downs, and tie-ups; so figure your winter requirements NOW. Descriptive bulletins listed and numbered above sent free immediately upon request. For over one-quarter of a century this winter heating equipment has saved contractors thousands and thousands of dollars. All equipment guaranteed for one year against defects in workmanship and materials.

AEROIL PRODUCTS COMPANY, INC.
75 Wesley Street
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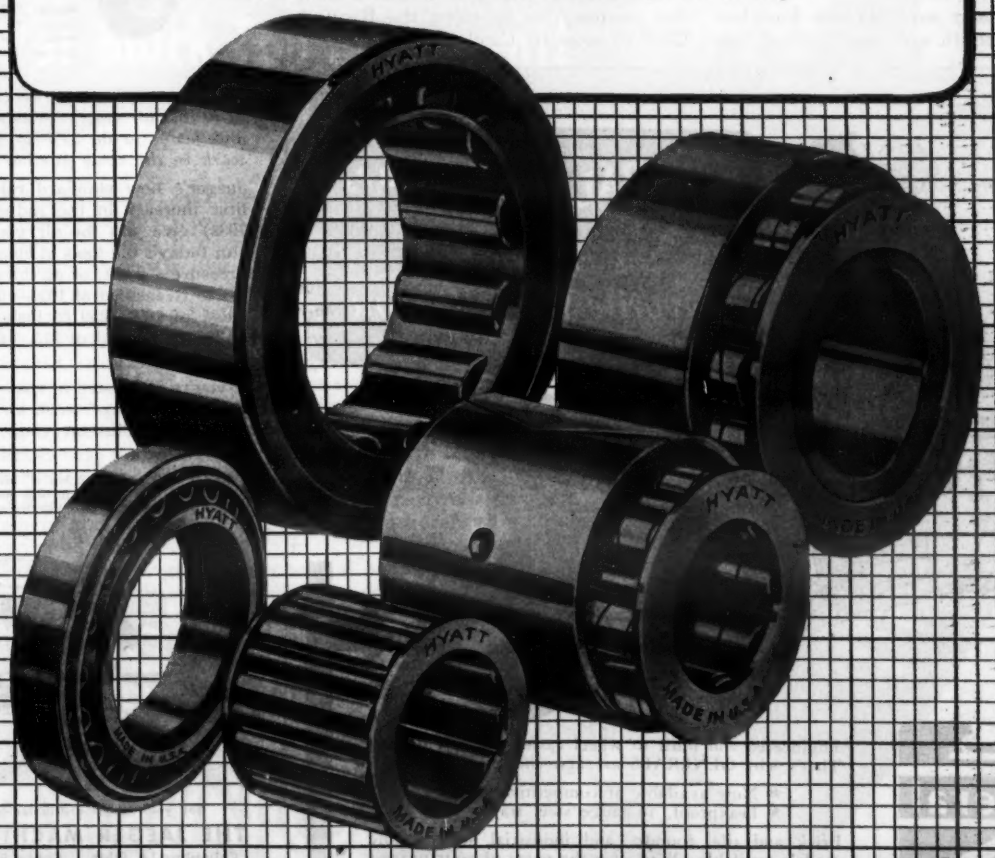
CHICAGO • DALLAS • SEATTLE
PITTSBURGH • LOS ANGELES
JACKSONVILLE • SAN FRANCISCO

The Line to Look to... HYATTS

Design engineers, for more than half a century, have learned to look to Hyatt for that better grade of roller bearings which adds to the operating efficiency of machines and equipment in almost every field.

We are probably making just the type, size and width Hyatt Roller Bearing you need for that new job you are designing—or for modernizing your present product.

To help you locate the right roller bearing to fit your job precisely we will gladly send you catalogs or if you wish to consult a member of the Hyatt Engineering Service staff—just write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT ROLLER BEARINGS

The Walter logger is a heavy-duty motor truck of 36,000-pound gross vehicle weight. Its winch and rear structure permit the lifting and dragging of pipes, logs, etc.

Heavy-Duty Logger And Truck Tractor

A new heavy-duty logger is manufactured by the Walter Motor Truck Co., 1001-19 Irving Ave., Ridgewood, Queens, L. I., N. Y. The Walter logger is a special heavy-duty motor truck of 36,000-pound gross vehicle weight, powered by a 240-hp gasoline or a 200-hp diesel engine, and equipped with large single 16:00 x 24 tires operating at low air pressure. The unit is provided with a powerful winch and a special structure at the rear to permit the lifting and dragging of logs, pipes, and other similar material. The derrick can be readily folded, and the unit can be used as a tractor with semi-trailers, or to haul other types of trailers.

Further information may be secured from the company. Or use the Request card at page 16. Circle No. 85.

High-Pressure Hose

A new spray hose is now being made by The B. F. Goodrich Co., Akron, Ohio. It is designed to utilize working pressures as high as 800 psi, and to handle many sprays which have previously been destructive to rubber hose. It comes in long lengths.

The company says the new hose has greater strength and less friction loss because of the extremely smooth tube employed in it. It can be used with hydraulic equipment, washing units, vehicle-undercoating equipment, and for other jobs where water, oil, emulsions, etc., are to be sprayed.

Braided construction with a high-tensile cotton yarn makes possible the use of only two braids in all sizes except the ¾-inch, which is made in three braids. The cover is a black lead press-molded finish.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 112.

Stand-By Power Plants

A catalog sheet, Form 449-SB, on Katolight stand-by power plants, has recently been issued by the Kato Engineering Co., 118 Maxfield Ave., Mankato, Minn. The light plants described are designed for emergency or stand-by service. They are powered by 1, 2, and 4-cylinder air-cooled engines. Seven ac models, with capacities from 3,000 to 15,000 watts, are presented. All have 110/220-volt 60-cycle 1,800-rpm operating features. A description of standard and accessory equipment is included on the sheet.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 93.

Annotated Bibliography On Mineral Aggregates

A bibliography on mineral aggregates has recently been issued by the Publications Office of the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. One of the tasks assigned the Committee on Correlation of Research in Mineral Aggregates was that of compiling a list of references. This chronologically arranged, annotated, and indexed bibliography—No. 6—completes that particular assignment of the committee. The task of compiling and annotating the references was done by Fulton K. Fears on the staff of the Joint Highway Research Project of Purdue University.

Copies of Bibliography No. 6 are available from the Highway Research Board at 60 cents each.

Building Maintenance

A "Maintenance Checking Chart" of products and processes for protecting buildings and structures has been issued by United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio. This chart contains a list of products and services offered by the company to plant and building maintenance men. Complete details and data regarding any product or process shown in the chart will be furnished on request.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 9.

General
General Wheelbarrow Co., Inc. Wichita, Kansas

Engineered and built to wheel easier and last longer. That's why GENERALS are first choice.

★ Now available at competitive prices.
★ Leakproof, 16-gauge steel trays.

Brick and tile, foundry and industrial steel handle models available. Write for the name of your nearest distributor.

"The Wheelbarrow with Orange Handles"

4 days' work! now done in 3 with JAEGER "air plus" pressure*

Model 125 — Runs 2 heavy or 3 medium breakers or heavy rock drill at full 90 lbs.

*With steady 90 lbs. pressure, instead of 70 lbs., air tools hit enough harder and faster to do 30% to 40% more work in the same number of hours.

Jaeger's new standard ratings (the first increase in the industry since 1932) give you the air you need to run today's big tools at steady 90 lbs. pressure — 75 ft. of air instead of 60 — 125 ft. instead of 105 — 185 ft. instead of 160 — 250 ft. instead of 210 — 365 ft. instead of 315 — 600 ft. instead of 500.

If you're interested in cost-cutting — producing 4 days' work in 3 — put a Jaeger Air Plus on your next job.

Model 600 — Runs 2 big 4" wagon drills at 90 lbs., drilling 30% to 40% more footage than you get with any 500 ft. compressor.

See your Jaeger distributor or write

THE JAEGER MACHINE CO.
Columbus 16, Ohio Cable: BIGANLITLE

Pumps • Mixers • Hoists • Towers
Bituminous Pavers • Aggregate Spreaders
Concrete Spreaders • Finishers

FOR HARD FACING AND REPAIR

Amsco® WELDING PRODUCTS

Ask for free reprint of Hardsurfacing by Fusion Welding

Toolface
FOR HARDNESS AND TOUGHNESS

Trunnion wheels, operating in limestone dust under 40 tons pressure, are hardfaced with Amsco TOOLFACE for long wear. TOOLFACE provides abrasion resistance up to 1100°F. where toughness is required; in this range TOOLFACE is both harder and tougher than the popular cobalt base alloys No. 1 and 6. Typical TOOLFACE applications are steel mill tong bits, lumbering chipper knives and metalworking cutting tools. TOOLFACE rods and electrodes are high speed steel with 575-675 BHN deposit hardness . . . weld readily to mild steel. Welded parts may be forged, softened for machining and re-hardened.

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AMERICAN MANGANESE STEEL DIVISION

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Offices in Principal Cities

For Over 70 Years Builders of Fine WHEEL BARROWS:
AMERICAN
STEEL SCRAPER CO.
Sidney, Ohio

Storm-Water Sewer For Miami Airport

Ditchers Dig Trenches for R. C. Pipe, 15 to 54-Inch; First Step in Large-Scale Expansion Program

✦ THE Miami International Airport at Miami Springs, Fla., has a new storm-water sewer running east and west along 36th Street, its northern boundary. In the 7,847-foot project length, 9,604 linear feet of reinforced-concrete main line and lateral pipe have been laid in sizes ranging from 15-inch, at the west end, to 54-inch at the east end. The project also includes 25 drop inlets, 26 manholes, and a pumping station. The latter is located at the east end of the line to lift the storm-water drainage from the low point in the pipe, and discharge it into the Miami River.

This improvement is the first step in the large-scale expansion program planned for the airport by the Dade County Port Authority, the agency that supervises and operates the Miami International Airport. The Authority awarded a contract for the new sewer construction to Joe Reinertson of Miami on his low bid of $208,776. Work got under way on March 11, 1949, and was scheduled for completion by the end of July.

Prior to this installation, the airport was without any storm-water drainage along its northern end, where several major airlines have located their hangars, shops, offices, and operating buildings. The average ground elevation in this area is only plus 7, and the water table is consistently high, being fed by numerous springs. Consequently, after a rain, water has remained on the ground for considerable time until it finally soaked through into the limestone stratum that underlies this region. With the new sewer system, storm water will run off the surface of the ground into the drop inlets and manholes which are spotted about this busy section of the airport. Laterals conduct the water to the main line, thence to the pumping station and the Miami River which empties into Biscayne Bay.

Trench Work

The bulk of the trench excavation for the pipe was done by three Buckeye ditchers. Two of these were medium-sized units, a No. 12 and a No. 312, capable of cutting a 28-inch-wide ditch to a depth of 6 feet. The big ditcher, Model No. 9, cuts a trench 38 inches wide with a maximum depth of 11 feet. The deepest cut on the project was 10½ feet at the east end. At the west, or high end, the cut was about 4½ feet deep. Throughout the project no sheeting or bracing along the sides of the ditches was required, since the soft limestone underlying rock held firm on vertical lines. In this respect, the nature of the subsoil was a favorable feature, but it also precluded the use of draglines as excavators. Moreover a good share of the pipe was laid beneath service roads, which meant digging through a 2-inch layer of asphaltic-concrete pavement that had been laid on an 8-inch rock base course.

In digging trenches for the larger-size pipes, the ditchers made two or three parallel cuts or strips, in order to have the trench from 3 to 4 feet wider than the pipe. Thus for the largest size of pipe, 54-inch diameter, a 96-inch-wide trench was cut out; a 48-inch pipe was laid in a 90-inch trench, and a 42-inch pipe was laid in an 84-inch trench. The usual procedure was to have a ditcher dig out a section of trench which was at once backfilled by a dozer. This permitted the machine to step over and excavate a parallel trench. If the backfill had not been made, one of the crawler treads on the ditcher would have had no place to ride. Sometimes this cut and backfill operation was repeated twice before the full width of trench was attained.

C. & E. M. Photo
A Buckeye No. 9 ditcher digs a trench 9 feet deep for some 42-inch storm-water pipe at the Miami International Airport, Miami Springs, Fla.

Finally the broken-up material that had been backfilled into the trench was dug out by cranes and clamshell buckets. The ditchers had broken up the pavement and the rock strata beneath into small easily handled fragments. At times only two strips were excavated by the ditchers, leaving a thin core from 6 to 8 inches wide separating the cuts.

(Continued on next page)

Below Top: **Here is a smooth, dense job laid by an Adnum.**

Below: **The Adnum is far more accurate because it operates from the finished surface.**

THE DIFFERENCE
that assures
Better Black Top Pavement!

THE Adnun Black Top Paver brings you features of design that mean better black top pavements. The Adnun Cutter Bar is different in that it is provided with teeth! These teeth combined with the oscillating motion "strike off" the material with a smooth *sawing action.* This action eliminates the drag that causes tearing and beveled edges on the teeth provide an initial compaction!

Here is a combination of advantages that assures the dense, tight surface necessary for long life and resistance to traffic and weather.

The rotating Breaker Bar, combined with the design of the Cutter Bar makes it possible to handle the very tough cold materials that make such fine pavements, such as Kyrock, and which other machines find difficulty in laying. Hopper design and Cutter Bar adjustments permit laying narrow sections of pavement and "feathering the edges" for smooth widening on crowned surfaces.

The Adnun brings you mechanical advantages no other Black Top Paver can bring you and combines them with lower cost upkeep and greater versatility. Don't buy a Black Top Paver without securing complete details.

- Full control for any mix.
- Lays stone, chips, cinder, soil cement, as well as black top.
- Retractable wheels save time in relocation.
- End Gates and Cutter Bar extensions handle materials beyond ordinary widths.

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C. & E. M. Photos

On the Reinertson sewer contract at the Miami International Airport, a Koehring 205 crane with a ¼-yard Blaw-Knox bucket (above) backfills a trench over reinforced-concrete pipe. From left to right in the other picture are Alan C. Stewart, Aeronautic Assistant, Dade County Port Authority; Leverne Reinertson, Superintendent; Laurence Brown, Engineer; Glenn Cannon, Foreman; and John Curry, Engineer.

Storm-Water Sewer For Miami Airport

(Continued from preceding page)

This slender dividing wall was then easily dug out by a crane.

Pumps Needed

Two cranes were in use on the job for excavating, backfilling, or laying pipe—a Koehring 205 ½-yard model, and a General ¾-yard unit. Both had 35-foot booms and were equipped with Blaw-Knox clamshell buckets for the dirt work. For dozing there were available an International TD-6, two Caterpillar tractors—a D4 and a D2—and a LeRoi Tractair which was outfitted with a 105-cfm air compressor.

Water was a constant problem caused by the number of springs in the area. Ditches that stood open overnight had to be pumped out the following morning before any pipe was laid. They were unwatered with pumps varying in size from 2 to 10-inch. Job equipment included four 10-inch pumps—three Moretrench and one Griffin; one Rex 6-inch; two Barnes and one Rex 4-inch; and four 2-inch pumps.

The reinforced-concrete pipe was supplied by the Associated Concrete Pipe Co. of Florida, Inc., and was delivered to the job from the Miami plant in trailer trucks. It was placed in the trenches by either of the cranes or by a pipe layer mounted on an International TD-9. The lime-rock trench bottom offered a good foundation for the pipe, and in some cases where the rock was not present, a layer of the solid material from another part of the job was placed in the trench.

Gravity Flow to Pump House

Storm-water flow to the pump house through the main line of the sewer is by gravity with a drop of 0.1 foot to 100 feet. All the concrete joints are caulked on the inside with oakum, and on the outside with a sand-cement diaper mortar joint. The mortar was prepared in two small 1-bag mixers. The backfill was placed in 18-inch lifts with great care in respect to the water content of the material being used. If too wet it was not used, and material was hauled to the section being filled from another part of the job. Water was added if necessary when the material was too dry.

The drop inlets and manholes are built of reinforced-concrete pipe up to the spring line of the pipe, and of brick above that level. Their tops at ground level are embedded in 8-inch slabs of concrete.

At the northeast corner of the field the pipe line passes under Le Jeune Road, the eastern boundary of the airport. From that point it is only a couple of hundred feet to the new pumping station alongside the Miami River. The pump house measures 21 feet 4 inches x 6 feet 6 inches and has a reinforced-concrete foundation supporting a welded structural-steel framework. The roof and sides are 20-gage sheet steel.

Pump-house equipment includes a 24-inch pump rated at 19,300 gpm with an 8-foot head, and driven by a 75-hp

(Concluded on next page)

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In PAYLOAD and PROFIT

Operators say it. Contractors show it. Records prove it! Omaha Buckets make every load a payload, every job a profitable one. The know-how of many contractors and engineers has been built into Omaha Buckets — surplus weight eliminated to give a greater total load; more sturdy design and construction for the tough digging jobs. For performance and profit on the job, Omaha Dragline Buckets Tops 'Em All!

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Goodall's finest large size air hose . . . especially designed for jumbos, caissons and other heavy-duty applications where reliability and safety are of prime importance. Built to stay *on the job longer* by withstanding continuous abrasive wear and damage from falling rock, tools, etc., KINKPROOF CONSTRUCTION assures a steady flow of air.

"Allgood Cord" is a "Standard of Quality" product . . . a designation warranted by years of outstanding service in the construction field. Made in 1½" to 4" sizes, in maximum lengths of 50 feet.

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electric motor; and an 18-inch pump, 12,000-gpm capacity with an 8-foot head, operated by a 50-hp motor. There are also gas-driven stand-by engines. The pump house goes into action automatically, first with the 18-inch pump, followed by the 24-inch unit when necessary.

Airport Expansion

The Miami International Airport, with 2,500 acres, and with a potential 3,000 acres, is one of the largest in the country. The first-stage expansion program, as outlined by the Dade County Port Authority, will call for the expenditure of some $9,000,000 for improvements. The ultimate long-range development plan will cost between $15,000,000 and $20,000,000. One of the major steps in this scheme will entail shifting the tracks and Hialeah Yard of the Seaboard Air Line Railway from its present location down the center of the big tract of land; the yards will be moved to a position approximately 3 miles northeast, and the main line to a point along the south edge of the field. After this is done, new runways can be developed and the central terminal erected. The storm-sewer installation, while but a small part of this general program, provides adequate drainage along the side of the field where it is most needed.

There follows a breakdown into diameter sizes of the 9,604 linear feet of reinforced-concrete pipe required for the contract:

Size of Pipe	Linear Feet
15-inch	1,829
18-inch	165
24-inch	465
30-inch	365
36-inch	650
42-inch	1,150
48-inch	1,900
54-inch	3,080
Total	9,604

Contractor Joe Reinertson employed a force of from 25 to 30 men on the storm-sewer project under the direction of Leverne Reinertson, Superintendent, and Glenn Cannon, Foreman.

Field supervision of the work for the Port Authority was handled by Laurence Brown and John Curry, Engineers. Hugh Peters is Chairman of the Dade County Port Authority; A. B. Curry is Director, and Alan C. Stewart is Aeronautic Assistant.

The project, which is financed jointly by the Authority and the Civil Aeronautics Administration, is in Region 2 District 2 of the CAA of which Harold A. Wilde is District Airport Engineer with headquarters at Jacksonville, Florida.

Ball-Bearing Lubricants

Silicone greases as ball-bearing lubricants are described in two bulletins issued by the Dow Corning Corp. of Midland, Mich. Silicone Notes No. D-5 give the properties, performance, and uses of these heat-stable and oxidation-resistant silicone lubricants. High-temperature stability is demonstrated in a table of bleed and evaporation values. A variety of test data on silicone greases is also included in this literature.

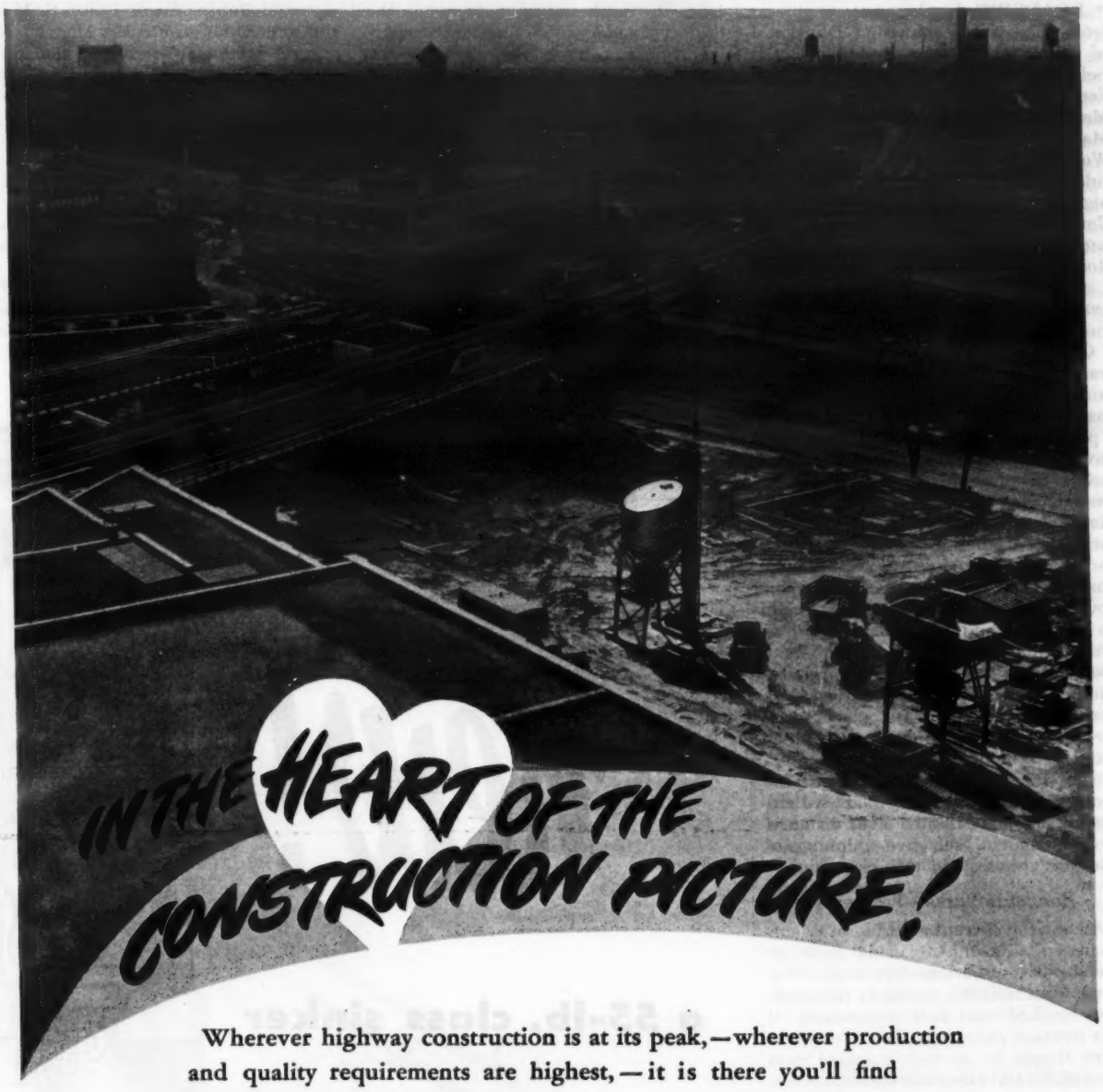
Silicone Notes No. D-6 tell how to use DC44 silicone grease in the bearings of electric motors. It includes instructions for lubricating open and single shielded ball bearings and relubrication schedules.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 86.

Bulldozer Specifications

A data sheet on the Southern bulldozer, made for International I-9 or ID-9 tractors, has been issued by the Southern Welding & Machine Co., P. O. Box 99, Charlottesville, Va. A hydraulic system, compactly mounted in the front, controls the blade operation. The thrust load is transmitted to the drawbar pivot bracket and is not carried by the tractor mounting pads. Moldboard lengths of 72 to 96 inches are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 69.



Wherever highway construction is at its peak,—wherever production and quality requirements are highest,—it is there you'll find Butler Batching Equipment.

Butler engineers design in the field,—on the job. The drafting table is only for refinement of the basic idea. That's why Butler equipment is *ahead* of job requirements in performance. Butler, knowing at first hand the standards of today's production,—designs, engineers and builds for what then become the standards of tomorrow.

That's why in Butler equipment there's an extra profit for the road-builder, and any other producer of concrete regardless of quantity requirements.

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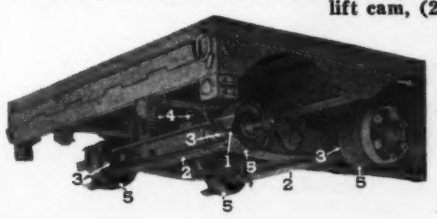
• Deep, wide flange main beams running the full length of the trailer, I-Beam sections for cross-members and outriggers, improved, fabricated gooseneck, and all electric-welded construction. Look at all the other features found only on Jahn tandem axles: (1) constant lift cam, (2) two full-width axles attached to longitudinal rocker beams, (3) worm gear type slack adjusters at each wheel, (4) heavy coil springs at each axle and (5) positive equalizing braking at each wheel regardless of position of axle.



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Roadside Engineers Hold N. E. Meeting

Informal Talks Cover Unemployment, Parks, Equipment, Other Subjects In 3-Day Session in R. I.

✦ ROADSIDE-development engineers from the states comprising Division I of the U. S. Bureau of Public Roads held their annual meeting in Providence, R. I., August 10-12. John V. McManmon, Landscape Engineer of the Massachusetts Department of Public Works, and Division I Coordinator, presided. Representatives from the state highway departments of Massachusetts, Connecticut, Rhode Island, New York, and New Jersey; the Bureau of Public Roads, Washington, D. C., and Division I office in Albany; and CONTRACTORS AND ENGINEERS MONTHLY attended the meeting.

One of the matters up for discussion was the role of roadside work in maintaining employment. In some northeastern states, unemployment is already a problem. For some time public works have been recognized as an important means of providing jobs in such an emergency. In roadside operations, there are many tasks which are necessarily hand-labor jobs. Many of these had to be neglected during the war and immediate post-war years due to manpower shortages. This can and should be remedied, and at the same time can provide jobs to offset unemployment elsewhere. It was suggested that statewide surveys be made of the work needed, and an estimate prepared of the man-hours of employment which could be provided. Some of these projects are the installation of proper drainage at trouble spots on old roads, widening, correction of limited sight distance, erosion control, selective thinning of roadside growth, and tree clean-up.

Roadside Parks—Problems

Among the current roadside problems discussed was the roadside park or parking-area program—how many, how large, what facilities should be provided, how marked, and how maintained. It was stressed once more that such waysides should in no way compete with state parks and other recreational areas. The sole purpose of roadside parks is to provide a convenient and pleasant spot where motorists may safely pull off the highway and park, to rest, relax, and eat, if they choose. They should, it was agreed, be small in area, simple in layout and equipment, and easily and economically maintained.

The location of signs for such waysides was also discussed. If possible, signs informing the motorist of such a roadside area should be placed along the highway at a sufficient distance from the park entrance to avoid the hazard of sudden stops, backing or turning around on the highway because the motorist has passed the entrance before realizing it.

Roadside debris is becoming a costly problem, it was reported. This is one reason for planned stopping areas. People stop and eat lunch along the roadside in any case, and their debris has to be cleaned up. This problem is lessened if waysides are provided with receptacles in which to place rubbish. However, in many localities, garbage, papers, and other litter are thrown along the roadsides from passing cars. To combat this, an educational campaign, seeking the public's cooperation, was suggested. This should include articles in newspapers; brief appeals over local radio stations, asking the public to keep the roadsides clean; and courteous signs along the roadsides. It was also pointed out that a few arrests of offenders—or at least warnings by the state police—might be effective.

At the final session, Rhode Island Director of Public Works Philip S. Mancini joined the group. Mr. Mancini expressed particular interest in the roadside-park program, because of the great public favor in which it is held, as evidenced by the use of the parks now in existence and the letters of approval and commendation received.

Other Subjects

Another item on the agenda was that of subjects for further study to be presented to the coordinators' meeting in San Antonio at the time of the AASHO meeting there. The topics suggested were the use of chemicals in roadside maintenance, public education and public relations, the problem of roadside trees and public utility permits for tree trimming, and roadside surveys.

There was an exchange of opinions on and experience with various machines—mowers, seeders, soil pulverizers, saws, etc.—for use in roadside operations. Another application of the Pulvi-Mixer was reported. In one state it is used to dig up and spread topsoil from woody areas bordering the highway down over roadside slopes. This has proved an economical operation to encourage volunteer growth of native material on the slopes.

Roadside Development in Design

Greater use of the landscape engineer's knowledge and experience in the design stage of highway work was urged. This is an important factor in better, more efficient highway-department administration, in order to secure more highway mileage with available funds. Considerable economy can be

(*Concluded on next page*)

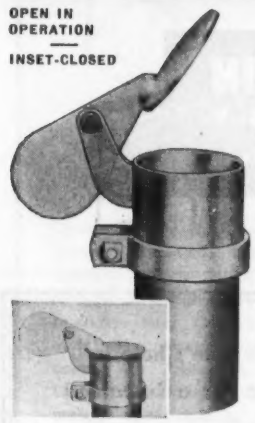
PROTECT ENGINES
ALL YEAR 'ROUND WITH
"WEATHERCAP"
EXHAUST PIPE COVERS

OPEN IN OPERATION — INSET-CLOSED

ENTIRELY AUTOMATIC

SIZES: 1-½" TO 5-¾" O.D.

A SIZE TO FIT ANY MAKE OR MODEL ENGINE—TRUCK—TRACTOR—TRAC-TRACTOR OR COMBINE



The "Weathercap" exhaust pipe cover is counterbalanced to open instantly from the engine exhaust pressure — closes automatically when engine shuts down. Simple protection against dirt, rain and insects during storage or idle periods. No restriction or back pressure, assuring full horsepower output.

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a 55-lb. class sinker with a 4-in-1 backhead

New in design . . . easy to hold . . . tops in drilling speed, rotation, hole cleaning and all-around performance . . . is the new CP-59 Sinker Drill.

Now, for the first time, you can get a sinker with a 4-in-1 backhead that meets *all* operating conditions: **plain dry . . . blower dry . . . plain wet . . . air-water** operation. One backhead meets all four requirements; change-overs from one type to another are quick and inexpensive.

Entirely new valve design gives maximum drilling speed and rotation power, with minimum air consumption. Large, flexible retainer spring makes for easy operation. A new type of lubricating system assures positive lubrication of all working parts.

Rotation nut and cylinder bushing liner are bronze, to eliminate scoring and reduce maintenance.

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achieved by incorporating the provisions for drainage, slope stabilization, erosion control, salvage of native growth, etc., in the plans and specifications instead of waiting to deal with those problems after the highway is built. Roadside development is not a phase of highway maintenance, it was pointed out; it is a phase of the development of the complete highway. As such, it is essential that the development of the roadsides be considered at the time plans are being made for the construction of the highway. It is also important that there be adequate supervision during construction to see that the roadside phase of the work is properly carried out.

"News Letter" Planned

It was agreed at the final session that the exchange of views and information had been so valuable that some means should be provided to continue such an exchange throughout the year. This, it was decided, should be a quarterly "news letter" in which questions could be asked and answered, new developments reported, and experience in solving any of the problems confronting roadside engineers passed along to others. Olive E. Potter of CONTRACTORS AND ENGINEERS MONTHLY was elected corresponding secretary, in charge of preparing and sending out this news letter.

A number of Rhode Island roadside picnic areas were visited on an inspection trip arranged for Division I landscape engineers. Here some members of the group look over the fireplace and refuse facilities.

Inspection Trip

John R. Griffith, Landscape Architect, and Horace D. Healey, Landscape Engineer, Rhode Island Department of Public Works, hosts to the group, arranged an interesting all-day inspection trip of Rhode Island's highways. Stops were made at many of the state's attractive roadside parks. Located in spots of natural beauty, these parks are fairly small in area, and have been left as much as possible in their natural state, with only the necessary facilities—picnic tables and benches, fireplaces, drinking water, and toilets—provided. The number of people enjoying them attests their popularity. Another feature of the trip was an inspection of the turf experiments being carried on at Rhode Island State College by Dr. Jesse A. De France.

It was tentatively decided to hold the next annual meeting of the group in New Jersey in May, 1950.

Top performance, minimum upkeep are assured by these features of new CP-59 Sinker:

1 Four-in-one backhead; plain dry, blower dry, plain wet, air-water operation.

2 New type valve gives exceptional drilling speed with powerful rotation.

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New Hydraulic Pump For Mobile Equipment

A new series V-200 balanced-vane pump designed for mobile equipment is announced by Vickers Inc., 1492 Oakman Blvd., Detroit 32, Mich. It is made in four capacities for operating pressures up to 1,000 psi.

The company says that a major feature of this new pump is its longer life at maximum efficiency. The V-200 is designed to maintain automatically and at all times correct radial and axial clearances. Not only is normal wear compensated for, but the pump also automatically adjusts its clearances to oil viscosity variations resulting from temperature change. As a result, correct clearances are maintained and more oil is delivered for useful work, the company says.

A Vickers feature of "hydraulic balance" eliminates bearing loads resulting from pressure. The vane principle provides for no-load starting—important in cold-weather cranking.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 55.

Material Handling

A whole line of material-handling devices is manufactured by Smith Devices, 331 N. 4th St., Philadelphia 6, Pa. It includes a variety of grips for drums, barrels, chains, rods, boxes, cable, timber and steel sections. A number of hooks and clamps are also made. The Smith wire-rope binder clamp will hold a line and allow unlimited take-up.

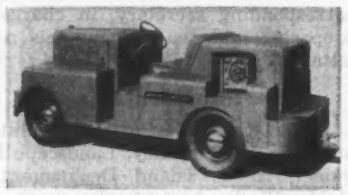
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 147.

Non-Agitating Hauling

A new 8-page 3-color pamphlet shows non-agitating delivery and placement of concrete on jobs ranging from sidewalks to giant dams. It is put out by the Dumpcrete Division of Maxon Construction Co., 131 N. Ludlow St., Dayton 2, Ohio, and features the Dumpcrete non-agitating concrete body. The construction, operation, and design of the body are fully described and illustrated.

Dumpcrete concrete, the folder explains, is air-entrained concrete mixed in a central plant and transported to the job in a Dumpcrete body. The body may also be used to haul bulk cement, rock, earth, or other materials that "flow". Testimonials, specifications, and design drawings are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 75.



The Hobart Weldmobile is equipped to roll to the job under its own power and make spot repairs with arc-welding, oxyacetylene-welding, and cutting and power tools.

Mobile Welding Unit

A fleet vehicle, designed as a mobile unit to make welding repairs in the field, is now being produced by Hobart Brothers Co., Box 389, Troy, Ohio. The Weldmobile is equipped to roll to the job on its own power and make spot repairs with arc-welding, oxyacetylene-welding, and cutting, and power tools.

Two models are now being manufactured: the GR-301-M with a 300-ampere welder for light to heavy welding requirements, and the GR-401-M with a 400-ampere welder for heavier duty. Either unit can be furnished with 1 or 3-kw auxiliary dc power for supplying lights and universal power tools. A coupler on the rear permits towing of additional equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 65.

Work on Pipe-Line Projects

Clearing, ditching, stringing, stabbing, wrapping, laying-in, and backfilling operations on pipe-line projects are pictorially presented in a 12-page booklet put out by Caterpillar Tractor Co., Peoria 8, Ill. It points out that Caterpillar diesel track-type tractors, bulldozers, and powered pipe-laying equipment are helping to complete the more than 36,000 miles of pipe lines scheduled in the United States and Canada.

Copies of the booklet, "It's Caterpillar All the Way", may be obtained from the company, or by using the Request Card at page 16. Circle No. 137.

Material Conveyors

A new line of stationary and portable conveyors is now being manufactured by the La Croix Co., New York Building, St. Paul 1, Minn. These conveyors come in 18, 24, 30, and 36-inch widths, with belt travel of 250 to 400 fpm. Lengths up to 150 feet are available.

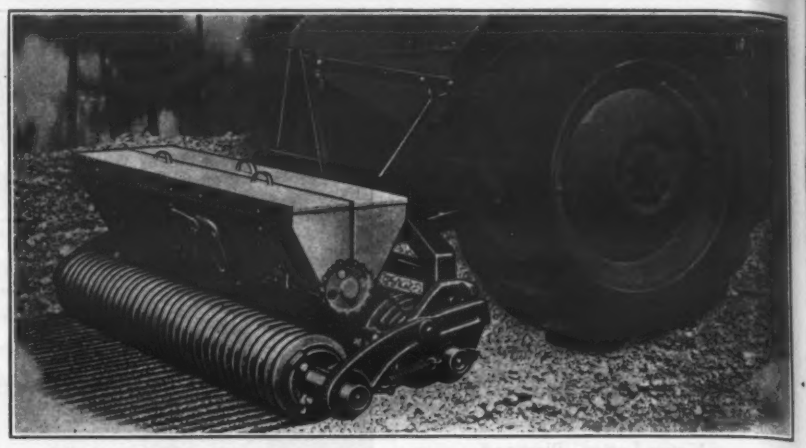
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 146.

Grass-Seeding Unit

For seeding shoulders and slopes along highways, parkways, etc., the Sure-Stand grass-seeding pulverizer and packer is offered by the Brillion Iron Works, Inc., Brillion, Wis. Of the lift type, the machine may be hydraulically raised clear of the ground for transporting and for backing to culverts and walls.

It is a compact unit, 5 feet 4 inches wide, with disks 2 inches on center to assure shallow covering of seed. The all-welded frame and heavy-duty end brackets are of sturdy construction and simple design. Self-aligning roller bearings on the ends of the wheel drums enable them to conform to contour of ground. The rear drum is spring loaded to give additional pressure for forming the seed bed.

It is designed to seed uniformly, and has a seed meter gage for selecting and maintaining the seeding rate. No seed is pressed deep into the ground. The front wheels crush the lumps of earth, leaving narrow, shallow grooves, the seed then drops between the front and rear rollers. The rear roller lightly covers the seed and firms the soil around it.



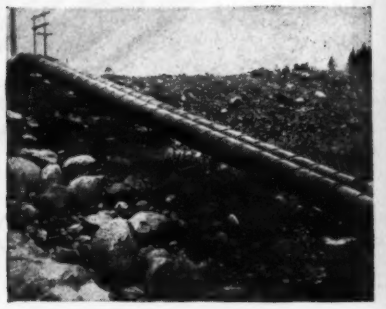
The Sure-Stand unit is designed for seeding on shoulders and roadside slopes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 149.

Why Contractors Specify

NAYLOR

Light-Weight Pipe



● Its light weight makes Naylor Pipe easy to handle and install.

● Its exclusive Lockseam Spiralweld structure gives Naylor Pipe the extra strength required so it doesn't have to be "babied" on those tough jobs.

● The spiral truss assures additional collapse strength—enables Naylor to serve ventilating jobs no other light-weight pipe can handle.

● The Naylor reinforced structure makes possible the high salvage and re-use value of this distinctive light-weight pipe.

● The Naylor Wedge-Lock Coupling, designed for use with Naylor Pipe, makes connections quicker and easier than ever before possible.

Specify Naylor Pipe for high and low pressure air and water lines • Push-pull ventilating • De-watering and drainage • Dredging • Hydraulic sluicing • Sand and gravel conveying • Well-point systems • Cement pumping • Composite piling • Exhaust and intake piping

Sizes from 4" to 30" in diameter, thicknesses from 14 to 8 gauge. Lengths up to 40 feet. All types of fittings and connections.

Naylor Pipe

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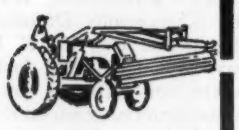
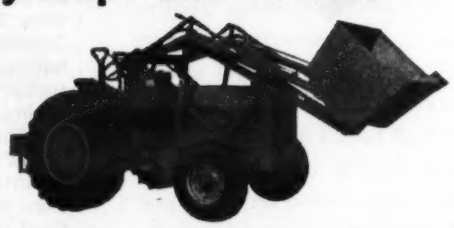


CRANE WORK



It's no secret! Materials handling people recognize the abundant power of the LULL Shoveloader — more power to dig—more power to load. They're talking about the unit's simple design and the wide variety of jobs it handles—and they're pleased with the return on their investment, too.

Shoveloader users know that the quickly interchangeable loader attachments give them a machine they can keep busy every day on all kinds of jobs.

See it to-day! Operate it—look it over! You'll find one of the three Shoveloader models ideal for your jobs. They easily mount on the leading makes of industrial wheel tractors. After looking the unit over, you'll find that — if you need an industrial wheel tractor — you need a LULL Shoveloader!

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THE WORLD'S LARGEST LINE OF Allied Equipment FOR INDUSTRIAL WHEEL TRACTORS

MINNEAPOLIS 6, MINN.

Maintenance Work Shown in Color Film

Missouri Makes Top-Notch Film of Maintenance Operations for Use in Personnel Training

+ A FIRST-CLASS color movie has been made by the Missouri State Highway Department to illustrate comparative maintenance methods. Photographed in color by Walter Pohl, Staff Photographer, the movies were planned originally as a visual aid to the training of maintenance employees. The films have already been shown to meetings of all division engineers and division maintenance foremen, and to Bureau of Public Roads engineers in Washington. They were tentatively scheduled to be shown when delegates of the American Association of State Highway Officials, of which Missouri's Chief Engineer Carl W. Brown was President last year, convened October 10 in San Antonio, Texas, for the annual meeting. At the conclusion of the San Antonio convention, Missouri's Engineer of Maintenance Rex M. Whitton plans to schedule meetings of maintenance men to view the films.

One roll of the movie depicts comparative methods of asphalt undersealing, which is now a standard maintenance procedure under ailing concrete highways in the state. The second roll shows various methods of concrete patching employed by the several divisions, and a third film is devoted to the restoration of bituminous surfaces through asphaltic road-mix upper decking.

The films have been received enthusiastically wherever they have been shown, because of the technical range of methods covered, and the general excellence of the photography. Sparing no effort to bring out costly and unsuccessful practices, as well as the ones which work best, the film exhibits them all.

At one point, for example, one film shows the early-day methods of asphalt undersealing, when asphalt was received in paper-wrapped rolls in box cars. The slow, costly preparation of the material is contrasted with the modern practice of truck-hauling, by tankers, direct from the refinery to the placing point without intermediate heating.

A running commentary by Whitton calls attention to important parts of the movie.

"The Little Things Count"

The movie was originally conceived when a wide disparity was noted in the little things which make up standard maintenance. The way the concrete vibrators were mounted in concrete patching work, for example, or the use of temporary plugs of various kinds on asphalt undersealing: these little things covered such a range that performance and cost sheets reflected the difference faithfully. Believing that mere criticism would be a bad approach, Whitton and Pohl put the comparative practices on the screen where the men could see for themselves.

The cost of concrete patching had varied between the divisions from $5 to over $8 per square yard. When the detailed methods, compared between divisions, were put on film, the reasons became crystal-clear. One division laboriously cut steel mesh reinforcement for patches, which did little or no good, but upped costs. Another wide-awake crew used temporary wooden chairs to take their concrete mixer across the patch, prior to the pour. It looked questionable, even though the district costs were very low, until a field man snorted, "Did you ever try to back a 16-S mixer down the highway?"

Even a little thing like the differences in concrete-vibrator mountings makes a variation in performance, and the film brings it out.

Asphalt underseal work, which has proved to be valuable in undersealing concrete pavements, is filmed in detail. Asphalt underseal stops mud pumping, and drives water from under slabs. It was discovered that a little thing like putting water around the underseal hole made or lost valuable time. One oufit used a mop . . . and they were not nearly as fast as the crew which simply splashed it on with a tin pail.

Wide variations in the use of temporary stopper plugs were also noted. One division tried to seal the holes with chat or earth. The film shows how inefficient this is, and when shown to the division foremen, they quickly got the idea.

The film has been very well received, with no hostility or resentment on the part of the men who have seen it so far. Yet it has the force of a hickory club, when applied to anyone in maintenance work who cannot see the forest for the trees.

New Office For Curly Co.

The Curly Construction Co., Inc., specialist in rock work, has announced the opening of its main office at 555 Cedar Lane, Teaneck, N. J. The firm has recently completed several contracts in New York and New England.

Koehring Subsidiaries Finish Plant Expansions

Plant expansions and improvements in progress for more than a year have been completed at the Parsons Co. in Newton, Iowa, and the C. S. Johnson Co. of Champaign, Ill. Both firms are subsidiaries of the Koehring Co., Milwaukee, Wis., construction-equipment manufacturer.

The new Parsons structure adds 16,000 square feet of space, most of which will be devoted to warehousing and shipping departments as well as new company offices. Johnson's new unit covers more than 22,000 square feet of production floor space in addition to 6,400 square feet for enlarged stockrooms and shop office facilities.

LOW COST PER UNIT OF WORK

Suppose you're considering two competitive brands of wire rope. They look alike, but one sells for a little less than the other. Bargain? Often it's anything but a bargain. For purchase price alone isn't the measure of wire-rope economy.

Sometimes you may find a wire rope with a lower price tag than Bethlehem's. But how does the cheaper one compare in total service rendered? How about its *Cost per Unit of Work?*

What a unit of work is depends, of course, upon the industry involved. It can be a ton of rock moved by a power shovel. Or a car of coal hauled up a slope. Or a ton-mile in oil-country rotary drilling. But in any case, unless your final rope Cost per Unit of Work is *low*, the rope has not done an economical job for you. That's why first cost—purchase price—isn't the sole yardstick.

Bethlehem wire rope is a quality product, one conscientiously built for long-range economy. When you buy it, you are spending your money wisely. You are buying wire rope that means, in the truest sense, *low* Cost per Unit of Work.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

The twin-blade principle of the new Jacobs self-propelled circular saw is designed to eliminate side-drag strain and grabbing action.

Circular Timber Saw

A new self-propelled hydraulic-drive circular timber saw, which features opposite rotating twin blades for added safety, is now being manufactured by The Jacobs Wind Electric Co., Inc., 2111 Washington Ave. N., Minneapolis 11, Minn. Powered by a 6-hp aluminum-built engine, this saw may be used for heavy timber felling, brush cutting, or general log and timber cutting.

Self-propelled through hydraulic transmission, with forward or reverse speeds at finger-tip control, this saw is said to cut trees up to 25 inches in diameter. It rotates at 300 rpm, without side drag and grabbing, the company says. The all-steel tubular frame, with balanced construction, is mounted on rubber-tired wheels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

Three Tamping Rollers

A catalog on three heavy-duty tamping rollers has been issued by the F. W. McCoy Co., No. 2 Santa Fe Drive, Denver, Colo. The Models SHD-2, USHD-2, and USBR-2 are designed to cover a wide range of work. They have maximum bearing pressures of 595, 1,308, and 1,600 psi respectively.

They feature shanks and removable tips of cast nickel-steel. The feet are replaceable in the field without special tools. The catalog also points out that a 6 or 7-square-inch tamping foot may be used. Illustrations, field photographs, and specifications are also given.

This information may be obtained from the company, or by using the Request Card at page 16. Circle No. 14.

ALWAYS SPECIFY

FLEXCELL

REG. U. S. PAT. OFF.

—because FLEXCELL BITUMINOUS FIBRE EXPANSION JOINT offers you all these advantages.

1. Flexcell Is Non-Extruding. Millions of tiny air cells permit compression without displacement. Will not extrude under pressure by adjacent concrete slabs.

2. Flexcell Is Resilient. Re-expands on release of compression, preventing open joint crevices. Flexcell's "recovery" under severe laboratory tests is over 70%. When weathering conditions are introduced, "recovery" ranges from 90 to 100%.

3. Flexcell Is Compressible. Compresses uniformly. No hard cross-grain, knots, or other defects. Gives 50% compression under load not to exceed 750 lbs. per sq. inch.

4. Flexcell Is Durable. Proved by years of actual use in major installations all over the nation. Withstands severest service, extremes of heat and cold. Made proof against termites and fungus by the patented Ferox process.

5. Flexcell Adheres Firmly. Its rough-textured surface grips and holds concrete more firmly. Keeps joints closed.

6. Flexcell Stays Put. No possibility of any piece, splinter, or strip working loose and protruding above surface of slab, thus impeding or endangering passing traffic.

7. Flexcell Is Moisture Resistant. Each of the long, tough bagasse fibres in Flexcell is coated with a durable moisture-proofing compound by the exclusive Flexcell Process.

8. Flexcell Has Easy Workability. Lightweight, easily cut with hand saw, readily stored, holds its shape indefinitely. Gives neat, finished joint with no trimming.

9. Flexcell Is Always Uniform. Precise scientific control during manufacture assures uniformity. Every square foot is uniformly dependable.

10. Flexcell Is Versatile. Outstanding for work requiring special cutting, tapering, and fabricating. Unsurpassed for concrete work above grade, around bridges, grade separations, overpasses, and concrete building construction. Replaces products of much greater cost.

11. Flexcell Is Economical. Measured in terms of performance and service, Flexcell is indisputably the most economical product of its type on the market.

12. Flexcell Is Quickly Available. Flexcell distributors conveniently located from coast to coast are kept supplied with ample stocks at all times. These distributors are equipped to handle all requirements, special sizes, cutting, punching—promptly, without delay.

PROMPT DELIVERY!

Write today for complete specifications and prices on Flexcell Bituminous Expansion Joint.

THE CELOTEX CORPORATION • CHICAGO 3, ILLINOIS

FOR FASTER, EASIER Drilling

THE McCARTHY VERTICAL DRILL

For record-breaking performance... for ease of operation, you can't top a McCarthy Vertical Drill. Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes! The derrick is raised and lowered by hydraulic power . . . finger tip controlled . . . and a 60 H. P. gasoline motor is part of the standard equipment.

The McCarthy Vertical Drill, manufactured by The Salem Tool Co., is adaptable to high wall and key way drilling and diamond drill boring . . . drills 90% of all limestone and sand rock formations, and readily burrows through shale. Send today for complete information, and for a free copy of The Salem Tool Company booklet.

MINING EQUIPMENT SINCE 1901

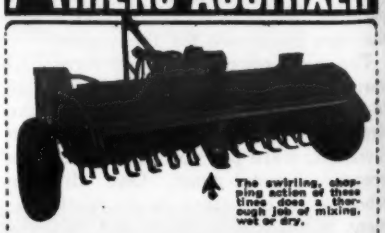
SALEM

THE SALEM TOOL COMPANY

SALEM, OHIO, U. S. A.

FOR SECONDARY ROAD CONSTRUCTION...

ARIENS AGGMIXER



The swirling, chopping action of these tines does a thorough job of mixing, wet or dry.

HERE'S equipment designed especially for mixed-in-place construction—to operate in connection with other general purpose equipment. Whatever aggregates are used it thoroughly pulverizes, mixes and aerates aggregates with binder—rapidly and economically. Also ideal for soil cement stabilization. Sets . . . made 4 standard sizes, 4', 5', 6' and 7'. Write for details.

ARIENS COMPANY BRILLION WISCONSIN

Two-Mile Dual Road Has Three Overpasses

Another Section Added to Outer Expressway Around The Greater Boston Area; Swamp Land Reclaimed

✦ WHEN a new 2-mile section of State Route 128 is completed this year, the Massachusetts Department of Public Works will have added another link to the expressway system that eventually will encircle the Greater Boston area. This latest addition to the belt route lies in the towns of Lynnfield and Wakefield, Essex and Middlesex Counties, about 10 miles north of downtown Boston. It is part of a circumferential highway on which traffic will flow from Gloucester, northeast of Boston, over State Route 128 and continue in a great arc north, west, and south of the capital until the coast is again reached southwest of the city.

This particular contract was awarded by the Massachusetts Department of Public Works to M. DeMatteo Construction Co., Inc., of Quincy, Mass., on its low bid of $976,598. It consists of a macadam-paved dual highway separated by a raised median strip, and includes the construction of three overpasses. This westerly extension of existing State Route 128 begins about a mile west of U. S. 1, the Newburyport Turnpike, and runs for 2 miles over new location to Main Street in Wakefield.

Of the three major structures in the contract, two are rigid-frame reinforced-concrete bridges with 52-foot spans carrying the highway over Main Street, Lynnfield, and Charles Avenue, Wakefield. The third is a reinforced-concrete 20-foot span over a single-track line of the Boston & Maine Railroad. The largest drainage structure on the project is a 15 x 8-foot box culvert, 72 feet long, through which the Saugus River flows under the new highway. Last year the heavy grading and drainage were completed, and the work on the bridges was well advanced. This season the structures will be completed, along with the dual macadam pavements.

Through Swampland

The new highway leaves the narrow, two-lane, twisting, existing alignment of Route 128 to follow a straight course over new location that contains a good deal of swampland. Consequently the new roadbed is mostly in fill sections of which the highest is 25 feet; the only roadway cut of any size is about 15 feet in depth along a sidehill. Fortunately the region is rich in deposits of gravel which was used to backfill the holes formed when the swamp muck was excavated from the roadway area.

These peat or muck deposits were dug out with two Northwest draglines —one equipped with an 80-foot boom and a Hendrix 2½-yard bucket, and the other with a 60-foot boom and a Page 1½-yard bucket. The peat was concentrated chiefly in three locations having an average depth of from 10 to 12 feet and beneath which lay strata of clay or silty sand. At one point the peat was excavated to a depth of 26 feet before firm material was reached. As the peat was removed, the holes quickly filled with ground water. Consequently only a small section of roadway was dug out at a time, and this hole was backfilled with gravel as rapidly as possible. The draglines worked from on top of the newly made fills, digging the peat from the roadbed clear out to the edges of the shoulders, and casting it out on the slopes. They usually worked in 40-foot stretches over half the road, and then did the other half after the initial opening was backfilled.

The chief sources of borrow material were two roadside pits of ample dimensions, yielding suitable gravel for both the backfill and ordinary borrow. They were worked by two shovels—a Northwest 2-yard and a Lima 2-yard —which were also used on roadway excavation. Hauling units with the

(*Concluded on next page*)

C. & E. M. Photo
In the borrow pit on the DeMatteo job on Massachusetts Route 128, a Northwest shoval with a 2-yard bucket loads a 14-yard bottom-dump Euclid.

WILLIAMS
"SUPER-HI" TENSILE STEEL
Concrete Form Hardware
Clamps—Tie Rods—Couplings
and Pigtail Anchors
GREATER SAFETY
LESS WEIGHT TO HANDLE
INVESTIGATE WILLIAMS ECONOMY
WILLIAMS FORM ENGINEERING CORP.
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Choose from America's most complete line of trucks for these 4 reasons

1 **International Trucks are specialized** for the job. International builds America's most complete line of trucks. It offers 22 basic models, 1,000 truck combinations ranging in gross vehicle weights from 4,400 to 90,000 pounds. It also offers 13 truck engines (gasoline, diesel, butane) as well as specialized units and parts, to satisfy individual hauling requirements. An International sales engineer who knows your business in terms of trucks helps you analyze your own hauling needs and select the right International Trucks to meet them.

2 **For the 17th straight year** International Trucks lead in heavy-duty sales. The country's most exacting truck buyers are the men who buy trucks of 16,001 pounds GVW and over. Their vote of confidence in Internationals is based on truck value —the same truck value found in every International . . . light, medium, and heavy-duty.

3 **More than half of all International Trucks** ever built—in 42 years—are still at work. International has been building rugged trucks uncompromised by passenger car design or construction since 1907. International Trucks are built to last—and they do.

4 **International Trucks are backed** by America's largest exclusive truck service organization. 4,700 Dealers and 170 Company-owned Branches offer complete International Truck service wherever you drive a truck. Precision-engineered replacement parts, factory-rebuilt exchange units, and factory-trained mechanics are as close as your telephone. For the right truck to solve your hauling problems, see your nearest International Dealer or Branch.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers
Tune in James Melton and "Harvest of Stars," NBC, Sunday afternoons

INTERNATIONAL TRUCKS
INTERNATIONAL HARVESTER COMPANY • CHICAGO

Two-Mile Dual Road Has Three Overpasses

(*Continued from preceding page*)

shovels consisted of twelve trucks of assorted makes holding an average of 6 cubic yards, and four bottom-dump Euclids carrying from 12 to 14 yards. Haul lengths for the trucks and Euclids ranged between ⅛ and ½ mile. On the shorter roadway hauls, averaging between 500 and 600 feet, the contractor had one LeTourneau and one Gar Wood scraper of 12-yard capacity, both being pulled by Caterpillar D8 tractors. Material, both for the backfill and the embankment, was spread in 12-inch lifts by D8 and D7 tractor-dozers. The required compaction was achieved by the heavy equipment, tractors and trucks, passing over the fills, plus a 3-wheel roller.

Dual Highway

In this wet location, roadway drainage was obtained with the installation of 4,650 linear feet of reinforced-concrete pipe from 12 to 36-inches in diameter. The pipe was supplied by the Hume Concrete Pipe Co. of Revere, Mass., and delivery to the job was made by trucks. Trenches for the pipe were dug with a Northwest 25, ¾-yard Pull-shovel.

The roadway has a 12-inch gravel bottom course for a foundation, extending out to the slope lines in the fills, and to the edges of the shoulders in the cuts. The roadway will include two 24-foot macadam pavements with a center crown of ¼ inch to the foot, and flanked by 9-foot shoulders that slope at the rate of ½ inch to the foot. The pavements are separated by a grassed median strip that is 7 inches above the elevation of the shoulders. The standard width of the median is 20 feet, but in a couple of locations it narrows down to 5 feet. It is bordered either with a sloped granite edging or with a sod berm. The roadway slopes, which are covered with an 8-inch blanket of peat, are either 4 to 1 or 2 to 1.

On top of the gravel foundation course the pavement consists of a 4½-inch base course of 1¼ to 2¼-inch crushed stone bound together with sand. Above this goes a 2½-inch top course of crushed stone that is penetrated with 2 gallons to the square yard of OA-3 asphalt. The surface is then sealed with a ⅜-gallon to the square yard application of OA-3 asphalt and pea-stone cover.

Bridge Work

The reinforced-concrete bridges were built with ⅝-inch plywood forms backed with 2 x 6 studs on 12-inch centers and double 2 x 6 wales on 2-foot 6-inch centers. The form panels were held together with Richmond ties on an average of 2-foot 6-inch centers. The reinforcing steel was furnished by the Bethlehem Steel Co. and placed in the forms by Oscar Horovitz Co. of Cambridge, Mass. Ready-mix concrete for the pours was supplied by the Wakefield Ready Mix Concrete Co. of Wakefield, Mass., which has a batch plant only 2 miles from the center of the project.

From the truck-mixers the concrete was discharged into a 1-yard bottom-dump concrete bucket which was lifted to the forms by a Northwest crane with an 80-foot boom. As the concrete was placed, it was vibrated with a White vibrator. The three major bridges are faced with granite that was supplied by the Eastern Quarries of Weymouth, Mass. The stone was delivered by truck and lifted to the working scaffolds by a Sasgen derrick hoist.

Quantities and Personnel

The major items involved in the dual-highway and bridge contract included the following:

C. & E. M. Photo

At the Main Street grade-separation structure in Wakefield, Mass., a piece of stone masonry is lifted to the deck by a Sasgen derrick hoist.

Roadway earth excavation	100,500 cu. yds.
Peat excavation	72,000 cu. yds.
Ordinary borrow	409,500 cu. yds.
Gravel borrow	53,000 cu. yds.
Crushed stone, base course	17,700 cu. yds.
Crushed stone, macadam surfacing	12,300 cu. yds.
Bitumen for macadam surfacing	192,500 gals.
Timber piles, railroad bridge	7,400 lin. ft.
Concrete	5,385 cu. yds.
Steel reinforcement	456,200 lbs.
Reinforced-concrete pipe, 12 to 36-inch	4,650 lin. ft.

M. DeMatteo Construction Co., Inc., employed an average force of 100 employees on the project under the direction of Joseph Pisciotta, Superintendent on the earth work, and Stanley Paskauskas, Superintendent on the bridges.

For the Massachusetts Department of Public Works, Fred D. Sabin is District Highway Engineer and John J. McCarthy is Resident Engineer. The Department is headed by William F. Callahan, Commissioner. Philip H. Kitfield is Chief Engineer, and Francis T. McAvoy is Construction Engineer.

Disk Plowing Harrows

A 12-page 2-color folder has been issued on the Rome line of heavy-duty disk plowing harrows manufactured by the Rome Plow Co. of Cedartown, Ga. These implements, the catalog points out, find wide application in the construction field for clearing, soil stabilization, soil conservation, and highway and airport maintenance. Equipped with 18, 20, 24, 26, or 28-inch disks, these harrows may be used in one or two sections, for cut widths of 6½ to 13 feet. Specifications for all models as well as on-the-job photos are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 49.

New Dallas Warehouse Opened by Chain Belt

Chain Belt Co. of Milwaukee has announced the opening of a new modern warehouse in conjunction with new expanded facilities for the Dallas District Sales Office at 1611 Dragon St., Dallas, Texas. Located a short distance from the Dallas business district, the well lighted air-conditioned offices and store will supply both Rex and Baldwin-Rex equipment.

RAINCAP

STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST . . . Just slip the "RAINCAP" over the open end of your tractor exhaust, and you eliminate forever the danger of moisture falling into the exhaust, injuring your tractor

THE CAP THAT DOES NOT FORGET TO CLOSE . . . Completely automatic—the "RAINCAP" is counter-balanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum with bronze bushing—can be installed in two minutes F.O.B. Waterloo, Iowa.

Write Dept. C-1

Immediate delivery

Liberal dealer discount

No.	O.D. Exhaust	Retail
1	2⅜"	$1.90
2	2⅜"	1.90
3	2¾"	1.90
5	1⅞"	1.90
55	2"	1.90
5x	1¾"	1.90
6	1½"	1.90
66	1⅜"	1.90
7	2½"	1.90
8	3"	2.50
9	3⅛"	2.50
10	3¼"	2.50
11	3½"	2.75
115	3¾"	3.00
12	4"	3.00
123	4⅛"	3.00
125	4¼"	3.00
14	4½"	3.00

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FlameZel TARPAULINS PREVENT COSTLY FIRES

Immediate Delivery from These Distributors

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INDIANA
Standard Equipment & Supply Corp., Hammond

MISSOURI
Brown-Strauss Corp., Kansas City
Machinery & Supplies Co., Inc., Kansas City
The Victor L. Phillips Co., Kansas City

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Contractors Material Co., Inc., Jackson

LOUISIANA
Pelican Well Tool & Supply Co., Shreveport

TEXAS
J. E. Ingram Equipment Co., San Antonio

OKLAHOMA
Mideke Supply Co., Oklahoma City
Leland Equipment Co., Tulsa
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Western Machinery Co., Denver

CALIFORNIA
Industrial Equipment Co. of Southern California, Los Angeles
Standard Machinery Co., San Francisco

COST VERY LITTLE MORE THAN ORDINARY TARPS

FlameZel
Flameproofed by WenZel
TARPAULINS

Manufactured by
H. WENZEL TENT & DUCK CO.
ST. LOUIS 4, MO.

Timberlock split-ring timber connectors are again available for the first time since the war.

Timber Connectors

Timberlock split-ring connectors are now available to the trade for the first time since the war, according to a statement issued by The Marsh Co., Hastings, Nebr. Previous to this time the entire supply has been allocated to Government construction.

These rings are true circles, precision-made from mild-steel strip. The edges are rounded so installation in the grooves can be made smoothly and quickly. The connectors are manufactured in two sizes, 2½ and 4-inch diameters.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 77.

Light Earth-Mover

A catalog on the Duplex hydraulic scoop, with a 1-cubic-yard capacity, has been put out by the Duplex Mfg. Co., 21st and Locust St., East Omaha, Nebr. This light earth-mover is designed for soil conservation, roadside development, and similar operations.

The folder indicates that the scoop is of durable construction, with a 9-foot length, 6-foot 2-inch width, and a 3½-foot height. This two-wheel scoop can be used with any tractor that is equipped with a power hydraulic lift. The features and specifications are included in the catalog, with photographs illustrating its operation.

This literature may be obtained from the company, or by using the Request Card which is inserted at page 16. Circle No. 129.

Zunic Made Dow Salesman

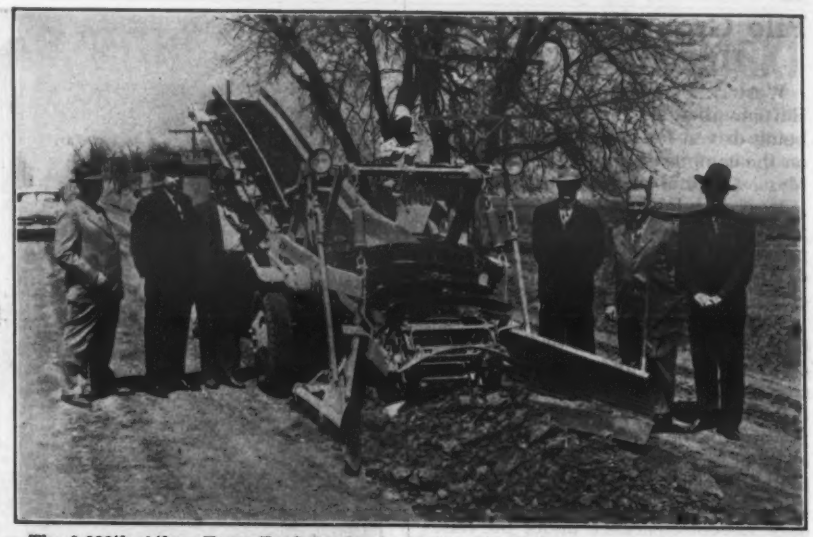
Recently assigned to the New York office of The Dow Chemical Co., of Midland, Mich., Matthew Zunic has taken up active duties as a Dowflake salesman.

Portable Aggregate Drier

A folder describing a portable aggregate drier for heating and drying materials prior to mixing has recently been issued by the Moorhead Machinery & Boiler Co., 927 Second Ave. S. E., Milwaukee 14, Minn. Especially adapted for maintenance work on bituminous roads, the vaporizing torch-type burner will, the company says, provide sufficient heat to give a 480-degree F exit temperature.

This Moorhead drier is 16 x 6 x 5 feet high and powered by a 3½-hp air-cooled Wisconsin gasoline engine. Adjustable legs regulate the inclination of the machine and thereby the rate of flow, and at the same time serve to reduce the weight on the pneumatic tires. The unit is easily attached to any vehicle. It can also be furnished with an electric motor and skid-mounted for stationary use.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 19.



The 1,000th Athey Force-Feed Loader to be turned off the assembly line loads windrowed earth for its new owner, Polk County, Iowa. Officials watching are, left to right, Commissioner Orville Armstrong, Athey Domestic Sales Manager Gerry Britton, Commissioner B. E. Newell, Commissioner Guy Williams, Sales Representative W. D. Lawrie of Gibbs-Cook Tractor & Equipment Co., and Commissioner Everett Armel.

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HEAT for
CONTRACTORS • TRUCKERS

Winter work revolutionized. *Portable Heater* (war surplus) heats construction jobs, houses—at low cost! 100,000 B.T.U.'s per hour on 1½ gal. gas. *Dries* paint, plaster, concrete. *Pre-heats* engines, tractors and trucks. *Thaws* engine radiators, pipes, frozen equipment, tanks. Heater has 3 long ducts to pipe heat to any points. 1½ h.p. air-cooled engine, starts like outboard motor. Made by Stewart-Warner for wartime use. Reconditioned, guaranteed in good working condition. Shipped by fast freight or express. Order today . . . supply is limited. Enclose check or money order. Replacement parts available. Brand new heaters available at $295.00 for delivery in Eastern Seaboard States from New England warehouse. 5% discount on lots of 10 or more. Special discounts to dealers.

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Super Service
ON ALL TYPES OF JOBS!

½ and ¾ Yard
EXCAVATORS

CRANES
UP TO 15 TONS

UNIT CRANE & SHOVEL CORP.
UNIT
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"You can tell it's a UNIT by the FULL VISION CAB. There's no other cab like it."

Every UNIT is FULLY CONVERTIBLE

Regardless of whether your job calls for a shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller, a UNIT machine easily "fills the bill"! For UNIT is convertible to ANY attachment and gives an excellent account of itself on ALL types of service. The change from one attachment to the other can easily and quickly be made on the job, by any ordinary mechanic. UNIT exclusive features include: Automatic traction brakes... Disc type clutches... One-piece cast gear case and above all, UNIT's safety-promoting FULL VISION CAB.

UNIT CRANE & SHOVEL CORP. 6309 WEST BURNHAM STREET MILWAUKEE 14, WIS., U.S.A.

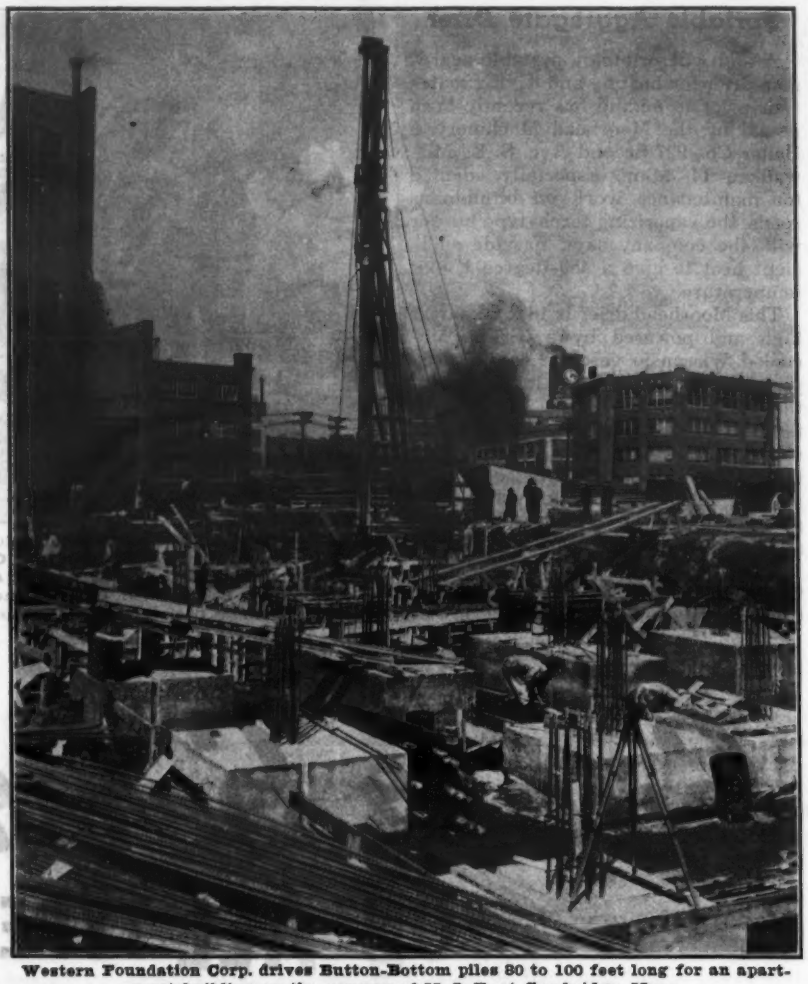
Pile Group Tested Under 450-Ton Load

Western Foundation Corp.'s Button-Bottom piles, 80 to 100 feet long, are being driven for an apartment building on the campus of M. I. T. at Cambridge, Mass. A total of 450 tons, one of the largest test loads ever placed upon a pile footing in this country, was used to prove the bearing capacity of sand underlying a deep stratum of Boston blue clay.

Western Foundation Corp. is driving 633 of its standard 12-inch-diameter cylindrical shaft piles for use at a designed load of 50 tons per pile. A 17-inch precast concrete button, serving as the base of the shaft, is driven to depths as great as 100 feet. A newly developed method permits Western to install the 100-foot length with 90-foot leads and only 75-foot clearance under the hammer. A 75-foot outside casing is driven to about ground level and then a 25-foot section is added and driven to the full depth required. The light, permanent shell is lowered inside the casing and filled with concrete, then both sections of the casing are pulled out of the ground by cables attached to the bottom section.

A group of six of these long piles was tested. Under the design load of 300 tons, the settlement was ¼ inch. At 150 per cent of design load—75 tons per pile, 450 tons for the group—the total settlement was 9/16 inch. After removal of the load the piles "recovered" to a net settlement of ⅛ inch.

The structure was designed by engineers and architects connected with M. I. T. and is planned primarily for apartments for the faculty. George A. Fuller Co. is general contractor. Thomas Worcester, Inc., has charge of field engineering.



Western Foundation Corp. drives Button-Bottom piles 80 to 100 feet long for an apartment building on the campus of M. I. T. at Cambridge, Mass.

Drag-Chain Conveyors

A new unit known as the Bosworth Drag-Chain Conveyall has been introduced by the Bosworth Mfg. Co., 6723 Denison Ave., Cleveland 2, Ohio. The standard length of the unit itself is 16 feet 6 inches on centers. It is of electrically welded construction. Its capacity is about 40 tons per hour. The type of power unit is optional: a single or three-phase totally enclosed electric motor or a 4-cycle gasoline engine can be furnished. The Conveyall is driven from the discharge end by a ⅝-inch pitch drive chain.

The chain flights are 11 inches wide and 3 inches high on approximately 16-inch centers. They have a lip so that, in operation, they become semi-buckets at maximum elevation. The drag-chain is held down by guards and the chain speed is approximately 75 fpm. The bottom drag plate is constructed of carbon steel and is replaceable. This new Conveyall is equipped with 1¼ inch shafts at tail and head sprockets, and self-aligning ball-bearing dust-proof pillow blocks. There is a chain slack take-up at the loading end. Special sizes may be secured for special applications of the Conveyall unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 92.

Industrial Engine Data

A catalog sheet describing Red Seal industrial engines is available from the Continental Motors Corp., Muskegon, Mich. The company offers 18 models of industrial engines, from 5 to 140 shaft horsepower. These engines use butane, gasoline, distillate, or natural gas, in open and closed power units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 130.

Plan Fifth Pan American Highway Congress in Peru

The Fifth Pan American Highway Congress will be held in Lima, Peru. Although the Congress is scheduled to convene every year, no meetings have been held since the one in Mexico City in 1941. Tentative date for the 5th Congress has been set for October, 1950, by the Peruvian Minister of Public Works, the Hon. Col. Jose del C. Cabrejos.

The decision to hold the Congress in Lima became known when the Minister invited the Asociacion Peruana de Caminos (the Peruvian Good Roads Association in Lima) to join the Organizing Committee for the fifth meeting. The association is an affiliate of the International Road Federation.

The Pan American Highway Congress—in whose activities the U. S. Bureau of Public Roads has always played an important role—is composed of official delegates of all American Republics. It serves as a medium for the exchange of technical and economic data on highways and highway transportation.

Tour of Truck Plant Presented in Booklet

A new booklet, being distributed primarily to branches and dealers throughout the world by the Autocar Co., Ardmore, Pa., offers a packaged factory tour of the plant. The "tour" is given by means of pictures and text which provide information an inquisitive visitor might require a week to obtain for himself on a conducted tour of the plant.

Entitled "Tough Tested Trucks", the booklet describes the men, materials, and machines that are engaged in building Autocar trucks and tractors. Primarily an illustrated description of research, development, and quality control at the Ardmore plant, the booklet explains Autocar's engineering "know-how" and precision manufacturing.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 156.

Crushing and Screening

Crushing and grinding machines designed to reduce all kinds of material to any selected size are treated in bulletins put out by The Williams Patent Crusher & Pulverizer Co., 2701 N. Broadway, St. Louis 6, Mo. These catalogs describe the equipment, list specifications for each unit, and estimate the capacities of each for reducing particular materials.

A catalog on the company's vibrating screens is also available. These screens are made with from one to four decks and in sizes to meet all screening jobs.

This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 41 for the bulletin on crushing and No. 42 for the one on screening.

for three quarters of a century

BERGER TRANSITS, LEVELS, ALIDADES and COLLIMATORS

have engineered with unfailing accuracy and eliminated costly errors on Roads, Highways, Building Construction, Bridges, Dams, Hydroelectric Developments and Geological Surveys and Maps as well as thousands of other projects of distinction, large and small.

No. 6¼—R— BUZKA Transit

● *You will save money and manpower and get a more accurate job with the long life and sustained accuracy of a Berger instrument.*

18" Dumpy Level ADEAM

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Built Better to Last Longer

Don't sell quality short. That's what makes satisfied customers. And that's what you'll find when you rely on the integrity of JACKMANCO methods. Built better . . . Last longer . . . More economy in the long run.

Superior Products Since 1876

JACKMANCO

MORTAR PAN

MORTAR MIXING BOX

JACKSON MANUFACTURING CO.
HARRISBURG • PENNSYLVANIA

The newest Warco general-duty motor grader on the market is the 76-hp Model 4D-76. The blade travels from 90-degree elevation on one side to 90-degree elevation on the other.

General-Duty Grader

A new 76-hp general-duty Warco motor grader, Model 4D-76, is announced by the W. A. Riddell Corp., Bucyrus, Ohio. It incorporates many new features already built into the Warco 4D-100.

Working advantages claimed for these two Warcos include: a blade which revolves in a full circle without removal of the scarifier or teeth, and which travels from 90-degree elevation on one side to 90-degree elevation on the other, without the operator leaving the cab; hydraulic control; a sliding moldboard for extra side reach; diesel engine; and ample working clearances.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 50.

Heavy-Duty Welder

A new heavy-duty arc welder, the Wilson 36A Yellow Jacket, is now being sold by The Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. It is built in 300 and 400-amp sizes. The current source is a 40-volt NEMA-approved variable-voltage generator.

The Yellow Jacket features simplified control of current output by means of a hand wheel mounted on the control cabinet. It is a complete two-bearing unit, engine-driven by sheaves and steel-cored V-belts. The belt drive reduces vibration by compensating for slight misalignments. For instant recovery voltage over a short circuit, the 36A generator is self-excited.

The welder comes in stationary or portable models. It is 76 x 26 x 49 inches in size. Optional equipment includes a choice of a 2 or 4-wheel trailer with pneumatic tires for use with the portable model.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 102.

Materials-Handling Unit

Four broadsides on the Roustabout crane are available from the Hughes-Keenan Co., Delaware, Ohio. The Roustabout is a mobile tractor-footed load-handler with a single lever control for each crane operation—boom swing, load hoist, and boom hoist.

This crane unit is designed for use with a number of different tractors. All specifications, features, and on-the-job illustrations are given in these catalogs. Special design charts show the Roustabout load-handling ranges.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 53.

Rust-Resistant Coating

A 16-page catalog on rust-resistant surface coatings has been prepared by the Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill. Rust-Oleum is the formulation of scientifically processed fish oil with high-grade pigment. It is made in a variety of colors, with either flat, semi-gloss, or gloss finish to meet most requirements for the protection of metal, wood, brick, concrete, etc.

The folder lists directions for the use and application of the coatings, finishers, and sealers made by the company. Small 1-inch square samples of the products are attached to the pages of the catalog. Below each sample, with its trade name and number, is a complete description of the product. Also listed are applications, resistant qualities, drying time, and thinner to be used.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 142.

Jaeger Sales Manager

The Jaeger Machine Co., Columbus, Ohio, manufacturer of construction and paving equipment, has recently announced the appointment of J. H. Yearling as General Sales Manager. Mr. Yearling, who has been with the firm for 22 years, will spend most of his time in the field, coordinating the work of the sales organization and Jaeger distributors.

NO BETTER DRILL for CONSTRUCTION WORK!

The Van Dorn ½" Standard Drill is high-powered; sturdy enough to withstand rough usage on the job; yet it's easy to handle, without an ounce of excess weight. Exactly the features you need for intermittent construction drilling! It drives twist drills up to ½" in steel; wood augers up to 1" in hardwood; Hole Saws up to 3½" in diameter. It's powered by a husky Van Dorn universal motor, tailor-made for this Drill—to get jobs done faster, at lower cost! See your nearby Van Dorn Distributor. Write for free catalog to: The Van Dorn Electric Tool Co., 787 Joppa Road, Towson 4, Maryland.

For Power Specify "Van Dorn" (DIV. OF BLACK & DECKER MFG. CO.) PORTABLE ELECTRIC TOOLS

EASY, INEXPENSIVE SOIL COMPACTION

The New BARCO RAMMER

Rammer—Starting

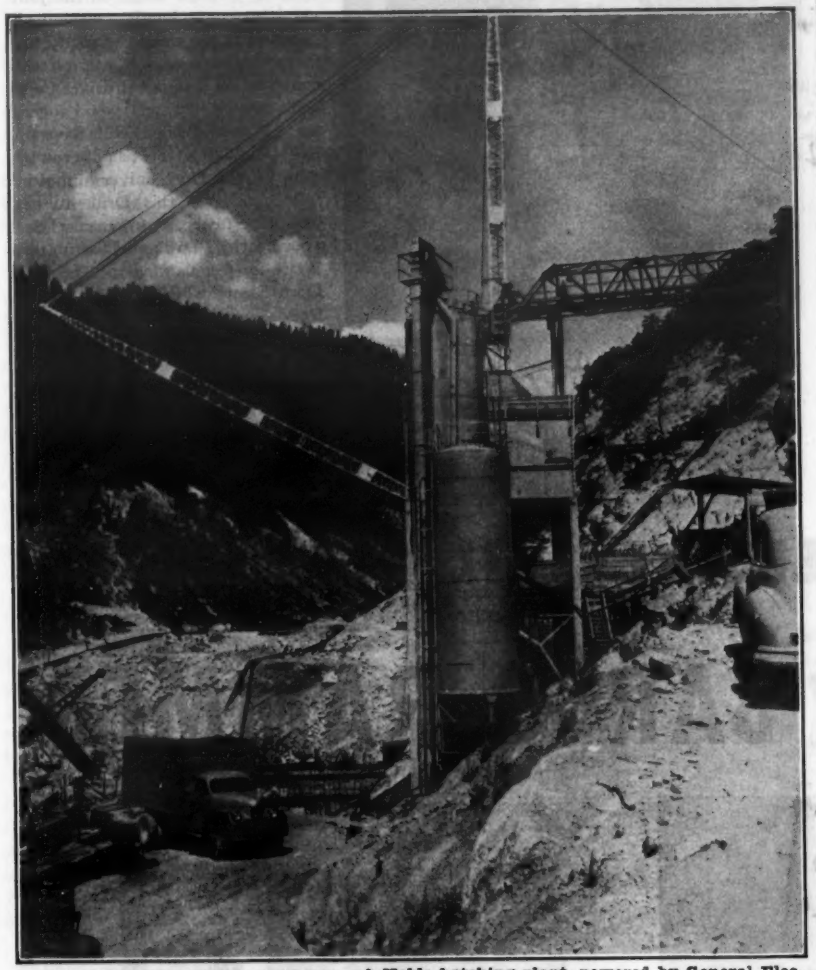
Rammer—Jumping

The new Barco Rammer is faster and more effective than any other type of tamper. It is easier on the worker, enables him to get more work done in less time, and at *lower cost.* Although rollers may do the compaction on large projects, they cannot reach locations close to abutments, culverts, walls and so on. But the new Barco Rammer remedies this situation, gives specified compaction. On large backfill tamping where a ditcher is used, the Barco Rammer works quickly and effectively. Today, with Federal, State and City authorities, as well as private corporations devoting more and more attention to these problems, the best answer is the Barco Rammer —the *entirely new* machine with the *entirely new method* of securing soil compaction. For more information write Barco Manufacturing Company, 1818 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO GASOLINE RAMMER

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

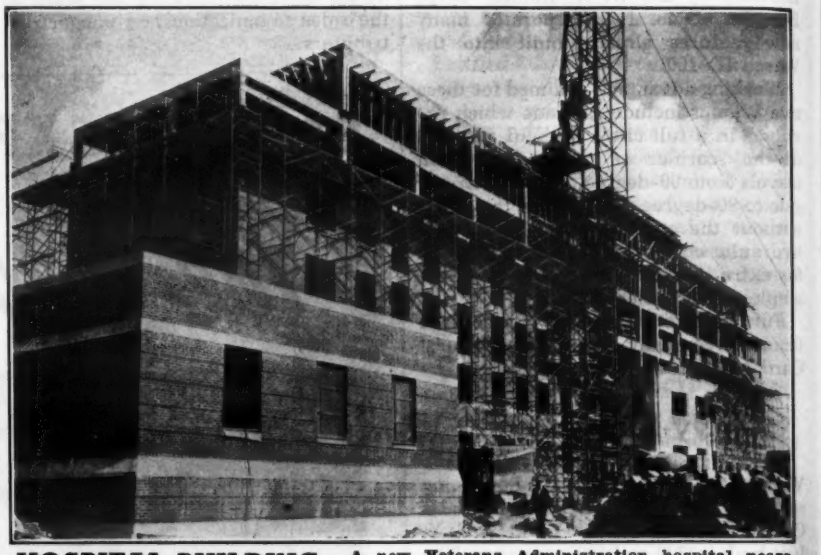
Construction Views Across the Nation



CONCRETE FOR DAM. A Noble batching plant, powered by General Electric motors, batches the mix for Cresta Dam, part of Pacific Gas & Electric's hydroelectric project on the Feather River, Calif.

STEEPLE REBUILT. E. J. Rose of Braintree, Mass., reconstructs the 150-year-old steeple of the First Religious Society church, Newburyport, Mass. With the steel framework in place, a crane hoists the scaffolding sections so workmen can build a replica of the 175-foot wooden spire. The church, with its historic steeple, was built in 1801 at a cost of $26,750.

WATER PIPE LAID. A Hough Payloader powered by an International UD-9 engine backfills cast-iron water pipe laid in Pineville, W. Va. Hayne Engineering Co. of Charleston was the contractor on the job.



HOSPITAL BUILDING. A new Veterans Administration hospital nears completion at Manchester, N. H. Contractor George A. Fuller used Trouble Saver sectional steel scaffolding on the $3,500,000 project.

ROAD FINE-GRADING. Here is a field expedient in use during construction of 3.8 miles of U. S. 10 between Coeur d'Alene and Post Falls, Idaho. Sather & Sons of Spokane, Wash., needed its motor grader on subgrade work. So for fine-grading it rigged up a 24-inch timber blade that fit between the forms and attached it to the bulldozer frame of a Caterpillar D7 tractor.

PLANT FOUNDATIONS. Over $3,000,000 worth of work is in progress at the chemical plant of Lion Oil Co., El Dorado, Ark.: foundations for an ammonium-sulphate plant (foreground) and a sulphuric-acid plant (center), plus improvement work on an ammonium-nitrate plant (background). Chemical Construction Corp. is supervising and Blaw-Knox Co. is doing the work.

Snow Fighters Are Public Nursemaids

(*Continued from page* 3)

fleet, therefore, is assisted by heavier equipment. There are 21 small V-type plows, without wings, on similar trucks as the one-ways are mounted.

Carrying this a step further, we find 11 bulldozers mounted on tractors ranging from D4's to D7's. The 73 state maintenance motor graders are all "on call" for snow-removal work in winter. They work exceptionally well on secondary roads, and they are hard to beat for leveling the snow ridges just off the road.

But sometimes the snow is too much even for the equipment listed. Then the "heavy artillery" comes up. Wyoming uses 29 large-size Wausau V-plows with wings, and mounts them on all-wheel-drive FWD and Oshkosh trucks. They will move a high snow ridge, they will smash through a drift, and they will buck through a slide loaded with rocks and trash.

The most powerful snow machines of all are 13 large rotaries. Twelve of these machines are Snogos, and one is a Bros. This heavy equipment is designed to eat through very heavy drifts or other large snow concentrations, blowing the material several hundred feet off to the side, out of the way.

Ironically enough, the main use for the heavy V-plows and rotaries is toward the last of the season, in spring. At that time of the year the ground is usually wet, and the extensive use of heavy equipment damages the highways unless the maintenance men use it very carefully. A motor grader is sometimes used to blade the snow back on the highway, so the rotaries can pick it up from there and blow it away.

C. & E. M. Photo

J. R. Bromley, Superintendent of the Wyoming Highway Department (left) discusses snow-removal strategy with John E. Wiley, Public Relations Engineer.

At the present time Wyoming is procuring radio equipment, with a view toward eventual FM communication on a statewide basis. Two-way communication between all district maintenance foremen and the heavier snow machines is now possible. Thus far only the rotaries and a few of the large V-plows have been radio-equipped.

A thumbnail sketch can be made in few words to tell about last winter's fight. Most of the rotaries worked over 400 hours in a month, one machine turning in 416 hours. It can well be imagined from that figure how hard the other equipment was working!

Methods

When a snowstorm begins in Wyoming, usually in the month of November, push plows begin to move the snow away immediately. Due to the flat backslopes and raised roadbeds made by design and construction, at least 80 per cent of the highway will remain clean by itself if there is any wind at all. In the worst blizzard of last winter, a new section north of Cheyenne just finished by a contractor remained open and trouble-free without any attention from equipment.

The remaining 20 per cent is vulnerable, however. The sections of highway comprising this 20 per cent soon become well known to the maintenance men, who watch these places above all others.

On the widest modern highways, Sutton likes to work two and even three

(*Concluded on next page*)

SPEEDY STARTING WITH STA-VIS ALL-WEATHER STARTING FLUID

EFFICIENT — This fluid will positively start heavy duty engines in coldest weather with engine in normal operating condition. Will produce starts in 10 seconds at 30° below zero.

PROTECTS — A special lubricating ingredient protects cylinder walls from wear during starting. Saves wear and tear on battery. Makes equipment last longer.

ECONOMICAL — So volatile and powerful is this fluid that a very small quantity starts the most stubborn engine. Costly delays are eliminated with a few cents worth of ALL-WEATHER fluid.

LIST PRICE (24 can case) $1.25 per Pint
(Slightly higher West of Rockies)
Order by Mail — Shipped prepaid

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STA-VIS OIL COMPANY
SAINT PAUL 1, MINNESOTA

ACE-HIGH EQUIPMENT

A 7 cu. ft. ditching bucket.
Yaun's Ditching Bucket, built to your size requirements.
Efficient motorless tailgate spreader.
Yaun's World famous Dragline Bucket, available up to 30 cu. yards.

The finest engineering science and only the top in quality materials go into the manufacture of YAUN equipment. Every piece of YAUN equipment is backed by a reputation of value and service. Complete information can be obtained from your YAUN dealer, or direct from the factory.

YAUN DRAGLINE BUCKETS AND MFG. PLANT
BATON ROUGE, LA.

Write for folder

Snow Fighters Are Public Nursemaids

(Continued from preceding page)

one-way plows one right behind the other. The men handle the snow in such a way that it is all swept off the highway, and the shoulders too, if possible. This sometimes means that the first pass may have to be taken from the shoulder edge. In very light snow, of course, the lead plow can work the center line, followed by other machines which take it out to the side. As much as possible, push plows throw the snow down-wind; seldom into the teeth of the storm.

Acting on the theory that it is easier to keep a highway clean than it is to open one that's blocked, the push plows often put in long hours. Two push plows in ordinary snow can take care of a 50-mile section of highway without overworking the men or equipment. It is when the unusual things happen, and the snow gets away from the men, that the heavier plows must be brought in.

In some of the level high country up near Jackson Hole, it is not unusual to see 6 feet of snow on the level ground. People drive through this snow for miles, and are never able to see outside the narrow trench. In a case of this kind the highway is maintained by V-plows or a rotary.

The proper handling of the snow ridge off the highway, according to Sutton, is one of the most important parts of snow-removal work. Unless this ridge is beaten down or disposed of near by, the next wind is sure to drift snow over the highway just about as high as that windrow of snow.

Wyoming's crews often use a simple 6 x 8-inch timber, fastened on a truck like an outrigger. This device will level a fair-sized ridge, and will get rid of one entirely if there is a steep bank over which it can be shoved.

It takes experienced men, very much on the alert, to handle the equipment. Let a fast-moving push plow hit an obstruction! . . .

The machines get preventive maintenance, too. They are lubricated in accordance with their manufacturer's recommendations. The engines get good fuel. During any lull, things are checked generally. When the big rotaries work week after week, the main drive chain, which for so long has been under terrific tension, will lengthen. Once in a while between storms mechanics or operators have to remove a link. If the chain gets longer than necessary and jumps, something breaks. It is always expensive to repair the damage.

Summer is the season for all extensive overhaul or repair work, and it keeps the mechanics at work during what would ordinarily be a slack season. By the first of November, it is again time to start installing push plows, and when the first storms hit, everything is in top shape and ready to go.

Wyoming is equipped to handle storms well beyond the normal expectations, but sees no point in trying to equip for a disaster like last winter, when all the snow equipment in the United States couldn't have coped with the continuous storms, ground blizzards, and heavy snow. Seldom these days do maintenance men have to work longer than 10 or 12 hours on snow removal.

The West Is Going Soft

In the meantime, some of the western people are getting soft. They depend more and more on the highway department.

The old days of the horse are gone. Last winter many a cattle and sheep ranch was caught without a saddle horse in the corral. People believe advertisements, and they have discarded the old-fashioned heating stove for newer-type oil furnaces. If they had oil reservoirs large enough for their stoves to burn a week or so in a bad storm, it wouldn't be so bad, but some have only enough to run from day to day.

They allow themselves to be caught short of food and other supplies. In this country, where some of the most rigorous weather in North America occurs, people have become slaves to their automobiles. They no longer walk, or ride horseback. They ride in an automobile. And they expect the roads to be open so they can run.

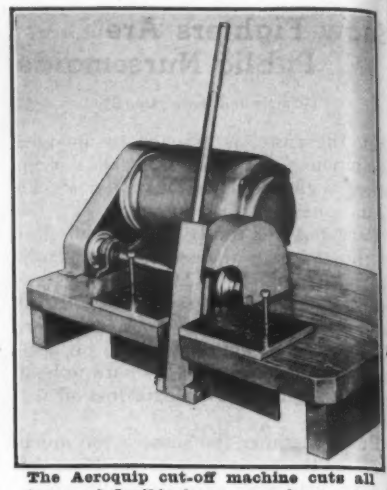
Many of them get themselves in bad, dangerous predicaments. A few break their necks. Some deliberately go out and take chances after the highway patrol has warned them off a stretch of highway blocked by slides. The highway department can't arrest them, and it *must* rescue them.

More and more that situation is seriously interfering with snow-removal work all over the west, running up costs, eating productive hours out of the work schedule. Wyoming, along with other states, is going along with it for the present, trying to rescue the people and clear the highways too. That costs $265,000 in a normal winter. Last year it skyrocketed to $618,000, an all-time record.

Hose-Cutting Machine

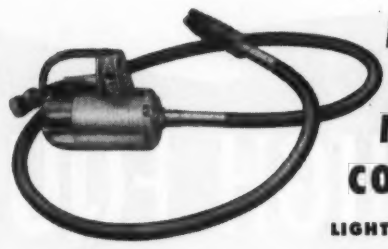
A new machine for cutting hose is now produced by Aeroquip Corp., 303 S. East Ave., Jackson, Mich., manufacturer of flexible hose lines and self-sealing couplings. Sturdily constructed and designed to occupy a minimum of space, the hose cut-off machine is easy to operate, says Aeroquip.

The machine can cut all types of flexible hose, even hose reinforced with plies of wire braid. It will accommodate sizes up to 3-inch outside diameter, and it cuts hose at 90 degrees in relation to the axis of the hose. The unit is small enough to mount on any ordinary shop bench and to be moved easily when not in use.



The Aeroquip cut-off machine cuts all types of flexible hose, even hose reinforced with plies of wire braid.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 56.



INSURE YOUR PROFITS with the New MASTER UNIVERSAL CONCRETE VIBRATORS

LIGHT WEIGHT • HIGH SPEED • GASOLINE OR ELECTRIC POWERED

MODEL No. 7
1¾" x 10½"

MODEL No. 8
2¼" x 11"

MODEL No. 9
2⅝" x 12"

The Universal Vibrating Ends shown above can be used with any model of Master Universal Vibrator. No. 9 end gives vibration equal to 3" Diameter vibrating end.

Drive-on rubber protective sleeves are available for all models of Vibrating Ends.

Master Universal Concrete Vibrators are simple and rugged, immediately usable by *unskilled labor*. Light weight, high speed, powered by either electric or gasoline motors, they save time and costs . . . protect and increase your profits.

They work any time, any place. The 24 lb. 1½ H.P. and 26 lb. 2½ H.P. electric models operate from A.C. or D.C. current, 25 to 80 cycles, 110 volts, or 220 volts when specified.

The 1½ H.P. electric motor has a vibrating speed in concrete up to 9000 R.P.M., and the 2½ H.P. motor up to and over 9500 R.P.M. The 1¾ H.P. lightweight gasoline engine powered vibrator has a vibrating speed in concrete up to 9000 R.P.M., and the 4.65 H.P. gasoline engine powered vibrator up to and over 9500 R.P.M.

Electric vibrators can be equipped with 22", 6', 12' or 21' lengths of Master Reversible Flexdrive. Gasoline models use 6', 12' or 21' lengths. Additional length up to 33' 6" can be used by adding the No. 72 Flexdrive coupling and extra 6' or 12' lengths of Flexdrive. A concrete Surfacing Tool is available for use with all Master Vibrators. You'll save time and labor and make more money . . . with Master Universal Concrete Vibrators. For complete specifications and prices, write, wire or phone today for Catalog No. 964.

Turn-A-Trowels • Vibratory Finishing Screeds • Power Blow Electric Hammers and Spades • Grinders • Engine Driven Generator Plants • Backfill Tampers

MASTER VIBRATOR COMPANY
222 Davis Avenue • Dayton 1, Ohio

JUNIOR MODEL "M"

BREAKS 9" REINFORCED CONCRETE FOR 4½¢ PER SQUARE FOOT

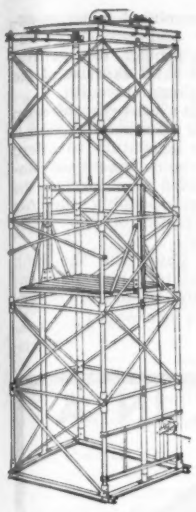
Powered by a 210 CFM Compressor and operated by *one man*, the Junior Model "M" reduces the cost of breaking, saves time and makes money for the contractor.

WRITE FOR COMPLETE INFORMATION

R.P.B. CORPORATION
2751 East 11th Street · Los Angeles 23, California

Breaking 9" Reinforced Concrete* on a recent job in Cincinnati

***Cuts 5-foot width in one standing**



Beaver materials-hoisting towers are of tubular steel construction and come in two types for heavy-duty and light-duty work.

Steel Hoisting Tower

Tubular steel materials-hoisting towers are now being fabricated by the Beaver Art Metal Corp., Ellwood City, Pa. The Dravo Corp., Dravo Bldg., 5th and Liberty, Pittsburgh, Pa., has been appointed exclusive national distributor for them.

The Beaver towers are made in two models for light and heavy work. The heavy-duty type has a live-load capacity of 5,000 pounds, or a 35-cubic-foot bucket, and can be erected to a height of 1,200 feet, the company says. The light-duty type has a live-load capacity of 3,200 pounds and can be erected to a maximum height of 200 feet. Both towers are available in the three-wheelbarrow cage size, and in both single and double wells.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 131.

Small Gasoline Engines

Catalogs on the Husky air-cooled and the Cub water-cooled gasoline engines have been issued by Cushman Motor Works, Inc., Lincoln, Nebr. The Husky is available in three models with 1.5 to 5.0 hp; the Cub in four models with 2.5 to 6.0 hp. Both series are 4-cycle 1-cylinder engines. All pertinent information concerning these gasoline engines, including specifications, is contained in the folders.

This literature is available from the company, or by using the Request Card at page 16. Circle No. 46.

Permanente Reopens Plant

The Permanente Cement Co., Oakland, Calif., recently announced the reopening of its Duwamish plant, at 5975 East Marginal Way, Seattle, for full operation. During the past 18 months, the $750,000 installation has been used only as a standby for cement storage. Pacific Northwest headquarters of Permanente has been shifted to the Duwamish location.

Loader Attachment For Motor Grader

A rear-mounted bucket loader has been announced as a specially designed allied unit for the Allis-Chalmers Model D motor grader. This ⅝-cubic-yard loader manufactured by the Tractomotive Corp. of Deerfield, Ill., has been built to take advantage of the Model D's features. Loader weight is reduced and the framework simplified by using the grader's channel framework as part of the loader frame. The company points out that the four large tandem wheels are able to carry the weight of loader and more material. Because it is rear-mounted, the loader does not interfere with prime functions of the grader, or affect the driver's vision.

Designed especially for the Allis-Chalmers Model D motor grader, this rear-mounted bucket loader has a ⅝-cubic-yard capacity.

The loader is shipped knocked-down and can be installed in the field with ordinary mechanic's hand tools; four clamps attach it to the grader frame. The TL-D loader also features hydraulically controlled dump, crowd action, replaceable hose fittings, and a heavy-duty hydraulic system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 88.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Taxes on Gross Income; Nonresident Concerns

THE PROBLEM: *Under joint arrangement, a Pennsylvania steel company furnished material for a building in Indiana which was constructed by an Ohio construction company. The contract was taken in the name of the steel company, but the materials were shipped by it to the owner for whom the work was done. The construction company did all the work, but payments were made to the steel company.*

The construction company paid the Indiana gross income tax on what it received as its share from the steel company for the conshare from the steel company for the construction work. Was the steel company liable terials and the work?

THE ANSWER: Yes. (Gross Income Tax Division v. Fort Pitt Bridge Works, 86 N. E. 2d 685, decided by the Indiana Supreme Court.)

Lawyers unsuccessfully argued for the steel company that it was not liable for a tax on so much of its receipts as belonged to the construction company, because it had nothing to do with the construction; and that it was not liable for tax on the receipts from the materials furnished, because it merely shipped them in interstate commerce from another state. In short, the steel company claimed that there were two distinct contracts—one for materials and one for the construction work.

On rejection of that argument, the steel company's lawyers fell back upon a contention that even if the steel company be regarded as prime contractor and the construction company a subcontractor, the latter was an independent contractor. But the court said that primarily the contract job was that of the steel company, and that even if the construction company was independent, in the sense that it was free from control by the steel company as to how the work was to be done, it nevertheless acted for the steel company in producing the result called for by the prime contract.

The Indiana Supreme Court laid down these basic rules of law as applying to the taxing power of a state over nonresidents:

"Unless the activities which are the subject of tax are carried on within the territorial limits of the taxing state by the one sought to be taxed, that state is without jurisdiction to impose the tax, and to do so constitutes a violation of the 14th Amendment to the Constitution." (The court cites the decision of the United States Supreme Court in the case of James v. Dravo Contracting Co., 302 U. S. 134. In that case it was decided that a gross income tax could be assessed by a state against a contractor on account of receipts for work done within the state for the Federal government.)

"Activities within a state are local, even though they are connected with, or are affected by, activities outside the state." (The court cites Kansas City Structural Steel Co. v. State of Arkansas, 269 U. S. 148, where the United States Supreme Court ruled that a nonresident corporation contracting to build a bridge within a state was engaged in intrastate business and so subject to a state licensing law. To the same effect is a decision of the Fourth Circuit Court of Appeals, in the case of Dravo Contracting Co. v. James, 114 Fed. 2d 242, a sequel to the case referred to in the preceding paragraph.)

"A corporation which contracts in the state of its residence to do work in a foreign state subjects itself to the jurisdiction of such foreign state notwithstanding it employs independent contractors to do the actual work and does no part of the actual work itself." (Here the Indiana court cites the Kansas City Structural Steel Co. case above mentioned and the decision of the Alabama Supreme Court in the case of Alabama Western R. Co. v. Talley-Bates Construction Co., 50 So. 341.)

Contracts to Acquire Government Material

THE PROBLEM: *Was the Reconstruction Finance Corp. liable to a prospective purchaser of cable and tractors belonging to the Government for breach of a contract to sell the same, under conditions indicated below?*

THE ANSWER: No, decided the United States Court of Appeals, First Circuit. (William J. Kelly Co. v. Reconstruction Finance Corp., 172 Fed. 2d 865.) The court said:

"We may assume, without deciding, that if the transaction had actually been consummated, the formal mechanism would have been a purchase from the WAA [War Assets Administration] by the RFC and then a resale by RFC to Kelly. But the most that can be said for the documents attached to the complaint, when read in the light of the disposal procedure in the present case, is that they show an undertaking by the RFC to 'resell' goods chosen by Kelly and made available by the WAA, and it is undisputed that the WAA refused delivery here. The record suggests no . . . lack of due diligence on the part of the RFC in seeking to complete the transaction, and, therefore, as a matter of law, no basis exists upon which the RFC could be held liable to Kelly for breach of contract."

Unlicensed Engineer's Right to Collect Pay

THE PROBLEM: *Partners engaged in engineering without having secured a license to so engage as required by the laws of their state. Could they compel payment for services in preparing plans and drawings, advising as to engineering problems, etc.?*

THE ANSWER: No. (Howarth v. Gilman, 65 Atl. 2d 691, decided by the Pennsylvania Superior Court.) The case involved industrial engineering services, but the decision and reasoning of the court would apply with equal force to construction engineering. The court said:

"A mere cursory examination of the multitude of highly technical and intricate exhibits and drawings prepared by . . . [plaintiffs] revealed that engineering knowledge was required and employed. Applicability of the statute . . . depends of course upon the nature of the work actually performed. . . . However, the extent of . . . [plaintiffs'] knowledge of the physical sciences, of mathematics, and other subjects fundamental to the practice of engineering, as was clearly employed here, is most persuasive that the services so rendered were in fact the practice of engineering, within the intendment of the Act of 1945."

The court rejected a contention that the statute was unconstitutional because it amounted to an unreasonable interference with one's right to engage in a useful occupation. The court said:

"The right to follow a chosen occupation is, of course, a property right; yet it is not an absolute right . . . in all circumstances. For where, as here, injury or harm may be visited upon the general public by those who are incompetent or unqualified to be so engaged, then necessary and reasonable restrictions designed to protect the general public clearly present a valid exercise of the police power of the Commonwealth. . . . Moreover, engineering is a learned profession with high standards for membership, and it is the intention of the legislature to afford protection from the encroachment of unauthorized practice, which may expose the public to injury. Unquestionably the Act represents a valid exercise of the police power of the legislature. . . .

"We need not now determine the limit beyond which the legislature may not constitutionally regulate the profession of en-

(*Concluded on next page*)

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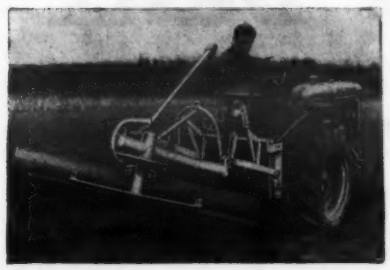

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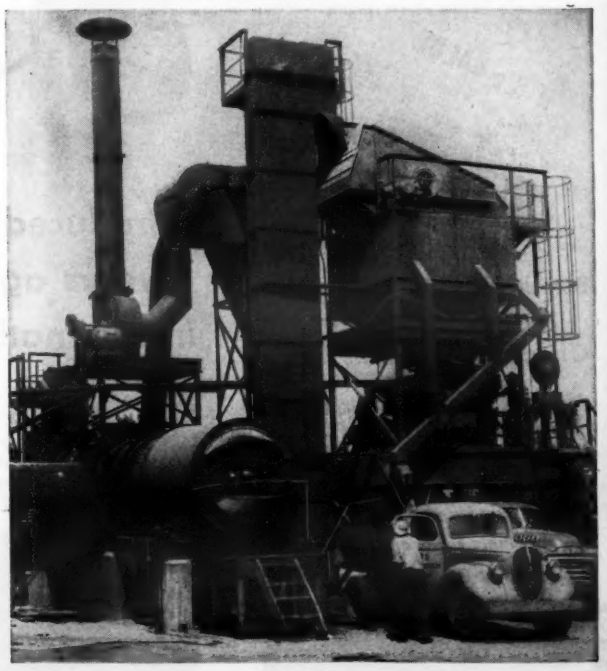

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Avoid Legal Pitfalls

(*Continued from preceding page*)

gineering or occupations approximating the actual practice of engineering. It is sufficient that in the instant case we are of the opinion that the . . . services performed for the . . . [defendants] are within the scope of the legislative enactment and that the Act as so applied is a valid exercise of the police power."

Dam-Gate Contractor Wins Delay Allowance

THE PROBLEM: *A Government dam contract required the contractor to place in the concrete structure two large roller gates to be furnished by the Government. The spec recited that it was "contemplated that the roller gates will not be delivered to the contractor until 250 days after receipt of notice to proceed." The gates were not delivered within the time reasonably contemplated by the contractor when he bid. Was the contractor entitled to additional allowances?*

THE ANSWER: Yes. (Morrison-Knudsen Co. v. United States, 84 Fed. Supp. 282, decided by the United States Court of Claims.)

In response to a contention of the Government, that it *contemplated* but did not *assure* the contractor that the gates would be furnished within 250 days after notice to the contractor to proceed, the court said: "If the statement . . . did not mean that they would be delivered at that time, the contract contained no promise whatever . . . as to when an essential part of what was to be installed under the contract would be available. The statement was made in an invitation for competitive bids on a contract. No rational contractor would have made a bid for the work of placing materials to be furnished by the Government, with no promise by the Government to furnish materials needed . . ."

In assessing damages in favor of the contractor, the court allowed: (1) The cost of a temporary tunnel to divert water from below-dam operations; this tunnel would not have been needed had the gates been promptly furnished. (2) Compensation for office overhead for the 90 days that completion of the job was delayed by the Government, and payroll of straight-time employees for that period. (3) One-half of the fair rental value of equipment kept on the job 90 days longer than would have been necessary except for the Government's delay; the other half was disallowed because the equipment was not in use and was not suffering wear and tear during a period equal to that of the delay of winding up the job.

Gov. Agency Supplies "Inefficient" Employees

THE PROBLEM: *Where a Government contractor, required to use local labor, chose to secure employees through the Federal Employment Service rather than through local unions, could he enforce a claim against the Government on account of inefficiency of employees supplied by the Employment Service?*

THE ANSWER: No. (Joseph Meltzer, Inc., v. United States, 77 Fed. Supp. 1018, decided by the United States Court of Claims.) Said the Court:

"The plaintiff, as it had a right to do, chose to obtain its labor through the Employment Service. That agency did not, of course, test a registrant [worker] to learn whether he was in fact skilled in the trade for which he registered. It referred him to a job, when one was available, and the employer had complete freedom to employ or not employ him, and, if he did employ him, to retain or discharge him. The plaintiff says that the carpenters supplied were seriously deficient in skill. We get the impression that the asserted deficiencies are, on the whole, greatly exaggerated, and that considering the unattractive nature of the 30-hour-week maximum to which the plaintiff agreed in the specifications, it got as efficient a force of carpenters as it had a right to expect in the area and in the circumstances."

Extra Pay Granted When Job Access Road Is Built

THE PROBLEM: *Specifications for a Government construction contract provided for the use of certain roads by the contractor as a means of access to the job site. But military authorities blocked the use of the roads. Was the contractor entitled to reimbursement for the cost of constructing a temporary road?*

THE ANSWER: Yes, decided the United States Court of Claims. (Gerhardt F. Meyne Co. v. United States, 76 Fed. Supp. 811.) After quoting the specification, the court said:

"This was a representation that such roads were available and plaintiff's bid was, of course, based upon it. . . . This case differs from those cited by defendant in that here there was a direct promise that these roads would be available. . . . In none of the . . . cases cited by defendant was there a promise that if costs were increased as a result of the exercise of sovereign power, defendant would pay the increase. We have here that implied promise. Defendant represented these roads would be available, from which it is to be implied that if they were not, the defendant would stand the increased cost."

Private-Road Haulage Not Subject to Tariff

THE PROBLEM: *A contract to haul dirt for Army-air-base contractors over private roads wholly within the air base fixed a rate lower than that fixed by state law for haulage over public highways. Did the agreement preclude recovery by the haulage contractor at the higher rate?*

THE ANSWER: Yes. (Kuhn v. Ferry & Hensler, 206 Pac. 2d 1, decided by the California District Court of Appeal, Second District.)

The court quoted a statutory prohibition against charging less than the rates approved by the state railroad commission, and then observed: "It is to be noted that the act is applicable only to a highway carrier who transports property for compensation over a 'public highway'. . . . In view of the fact that the hauling was not over a public highway of the state . . . the act and schedules adopted pursuant thereto were not applicable to the present situation, and the compensation to be paid was a matter for agreement between the parties and governed by the contract."

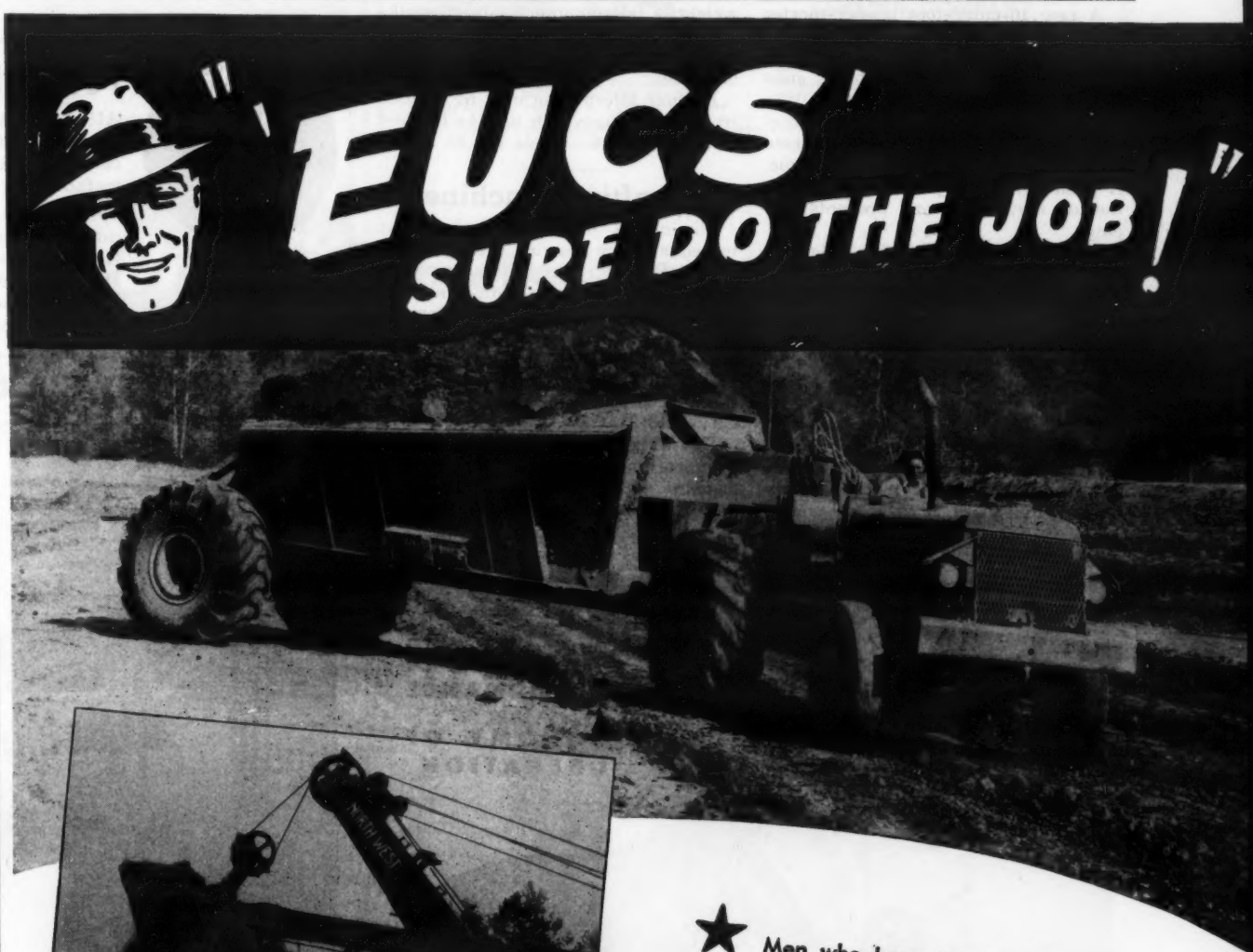
Under Miller Act, Surety Liable to Subcontractor

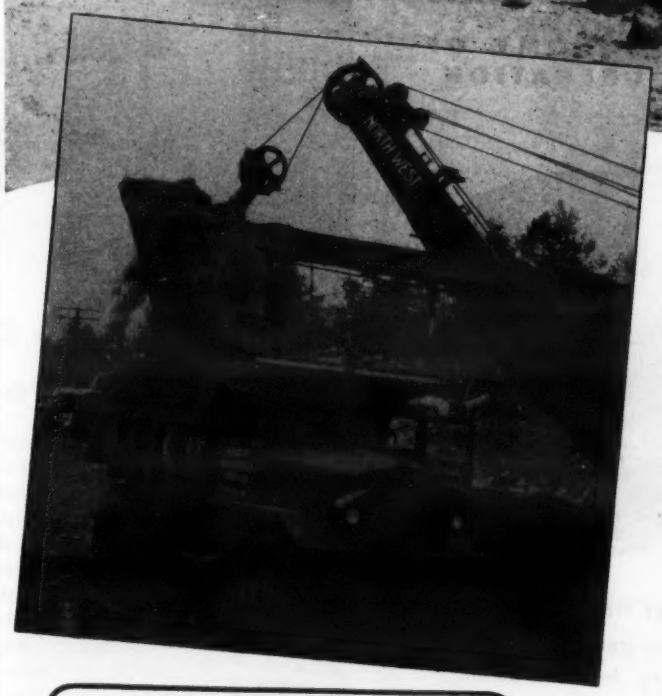
THE PROBLEM: *Did a bond given by contractors on a Federal irrigation project render the surety liable to a subcontractor for an amount due the latter for extra work?*

THE ANSWER: Yes. (Continental Casualty Co. v. Schaefer, 173 Fed. 2d 5, decided by the United States Court of Appeals, Ninth Circuit.)

The contractors' surety unsuccessfully argued that the subcontractor's claim was one for damages for breach of contract and therefore was not covered by the bond.

The Miller Act (40 U. S. Code, sec. 270a) requires that Federal contractors furnish bonds for the protection of labor and material claimants. The court cited decisions of the Federal Courts of Appeals, to the effect that such a bond does not cover claims for breach of contract. But it noted that, in this case, the agreement between the prime contractors and the subcontractor contemplated that the latter was to perform extra work, which the former were originally obligated to perform, in order that the prime contract between the general contractors and the United States could be performed. In performing the new agreement, the subcontractor furnished labor and materials agreed by the general contractors to be supplied under the prime contract, and hence "labor and materials" within the bond provisions of the Miller Act.





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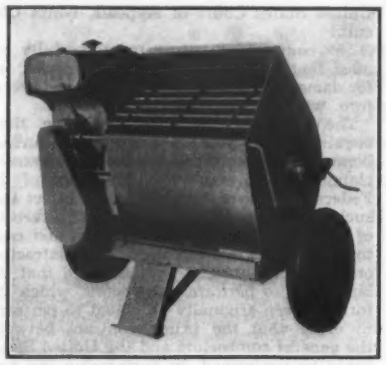


The 10-P Kwik-Mix plaster-mortar mixer is of the non-tilt end-discharge type. It has a charging height of 46 inches.

Plaster-Mortar Mixer

A new 10-cubic-foot plaster-mortar mixer designed for high-volume production was recently introduced by Kwik-Mix Co., a Koehring Co. subsidiary located in Port Washington, Wis. Mounted on two wheels with extra-wide treads for easy towing, the new mixer is a non-tilt end-discharge type. A push-down tow pole facilitates on-the-job movements and prevents tipping.

The mixer has a charging height of 46 inches for easy loading. Non-clogging mixing blades in the drum are arranged for radial and longitudinal adjustment and produce end-to-end mixing action and rapid discharge. Blades are designed to scour the drum with each revolution.

This 10-P mixer is equipped with anti-friction bearings throughout; paddle shaft bearings are mounted outside the drum to prevent material from working into them. A 15-hp air-cooled engine furnishes power for the mixer and the 800-pound-capacity hoist for delivering batches above ground level. The hoist is optional equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 79.

Supercharged Diesel

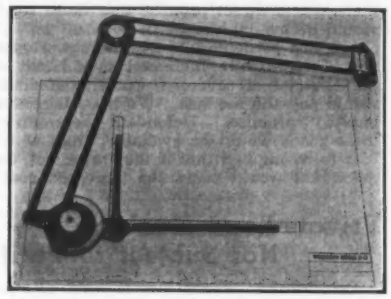
An improved supercharged NHRS-600 diesel engine is now in production by the Cummins Engine Co., Inc., of Columbus, Ind. Available in automotive, industrial, and marine models, this high-speed diesel develops 300 hp at 2,100 rpm. It has the same size and installation dimensions as the Cummins NHS-600, but features a completely new fuel pump; 56 per cent smaller size and 65 per cent lighter weight; a fully counterbalanced crankshaft; improved piston design; and an improved tubular type of lubrication-oil cooler.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 43.

Drafting Machine

Eliminating obstructions along the top edge of the drawing area, the new Model D Wrigraph drafting machine mounts in the extreme right-hand corner of the drawing board. This new instrument permits free movement of the scales over the entire drawing area without interference. It is manufactured by L. G. Wright, Inc., Box 63AD, Cleveland 21, Ohio.

The Wrigraph is a portable unit for technical men who want to carry a machine with them for use anywhere, and it can be fastened to any board or table. The drawing area is 20 x 26 inches. It is calibrated through eccentric adjustments built into the mechanism. Interchangeable engine-divided scales in all of the standard graduations are available. The lightweight protractor can be locked at any angle.

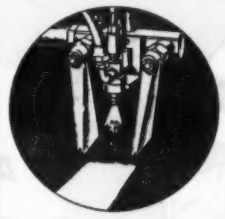


The Model D Wrigraph drafting machine mounts in the extreme right-hand corner of the drawing board to eliminate all obstructions along the top edge of the drawing area.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 114.

Rubber-Tire Authority Joins R. G. LeTourneau

Carl D. Smith, with the Firestone Tire & Rubber Co. for 26 years, has joined R. G. LeTourneau, Inc., as Special Representative of the Sales Division. Currently, Mr. Smith will headquarter in Peoria, Ill. He has for many years been closely associated with the heavy-machinery industry in the development and use of large rubber tires.



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New Book Surveys Trends, Problems Of Transportation

Many phases of the $30,000,000,000-a-year automotive transportation business have been studied, analyzed, and discussed—automobiles, trucking, highways, etc. But only minor attention has been paid to the overall problems of automotive transportation in its entirety. This lack has been remedied in a new book "Automotive Transportation—Trends and Problems" by Wilfred Owen, published by The Brookings Institution.

In this study, Mr. Owen has considered all phases of this vital factor of our national economy: the role of automotive transportation; the trends in cost and service which have contributed to transportation economy and quality, and hence to increased motor-vehicle ownership and use; the effect of highway inadequacies on transportation cost and quality; the outlook for improvements in the motor vehicle; the importance of parallel achievement in the management of the highway system; and the economic problems involved in highway modernization.

A combination of lower prices and higher quality of product has stimulated greater use of motor vehicles. But, Mr. Owen points out, our highways have kept pace with neither the technological improvements making possible greater speed, nor the increase in traffic. Many of the economies provided by the automobile, tire, and gasoline industries are offset by the higher cost of motor-vehicle operation resulting from inadequate road facilities. Recent records of operating costs show how directly gas and oil consumption, tire life, wear and tear on brake drums, cylinders, and bearings are related to the types of roads over which vehicles are driven. A good road, says Mr. Owen, is no longer one which merely holds up in bad weather; it is one which provides fast safe low-cost convenient and comfortable transportation.

"In view of the higher quality of transportation and the lower cost of operating the motor vehicle on highways of proper design, it is clear that determination of the proper level of highway expenditure requires a balancing of total transportation costs and benefits under alternative conditions." In weighing the desirability of spending more for highways, Mr. Owen says, we must look not only at the 5 to 10 cents of the transportation dollar which applies directly to highway finance, but also at the 90 to 95 cents in vehicle operating costs which are affected by highway policy. "It is not possible to divorce the problem of paying for highways from the problem of paying for highway transportation, for they both relate to the same transportation dollar", he says.

Improvement in the highway situation, the book suggests, may be secured by more effective highway-department management; study of the governmental units now responsible for our highways and determination of what size and type of administrative unit is most capable of providing adequate facilities; greater efficiency in the use of available facilities through better traffic engineering; improvement in traffic rules and regulations, and in handling the parking problem; a modernization of policies of land acquisition for highway use; adequate design for traffic volume, speed, and safety; and a complete reappraisal of our highway financing methods.

"Our principal weakness", Owen states, "lies in the absence of progressive highway management and realistic financial policy. If maximum economic progress is to be achieved in the field of automotive transportation, the overhauling of outmoded public policies is the principal challenge."

This book presents a challenge to highway officials, engineers, road contractors, and all others concerned with the highway industry. It should stimulate a new approach to the problems; and result in a broader view of highway transportation and its role in the national economy. We recommend it as "required reading" for everyone involved in the tremendous task of providing adequate highway facilities for present and future highway users.

Copies of "Automotive Transformation" (148 pages) may be secured from The Brookings Institution, 722 Jackson Place, Washington, D. C. Price: $2.00.

Small Portable Pumps

A new broadside, LP-9, on pumps has just been issued by The Jaeger Machine Co., 701 Dublin Ave., Columbus 16, Ohio. This bulletin covers the Model 1½ AP and Model 2 PAF. These Bantam pumps are small, compact, and easily portable units especially designed for contractors' use.

Available in a choice of a salt-water-resistant lightweight aluminum alloy or a semi-steel construction, they are complete with gasoline engine or electric motor. All specifications and performance data for these pumps are given in the bulletin, with photographs of each model.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 152.

Aluminum-Alloy Scaffolds

Circulars on aluminum-alloy scaffolds are available from Up-Right Scaffolds, 1013 Pardee St., Berkeley 2, Calif. These data sheets list all features of aluminum scaffolds and illustrate each model.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 64.

LANSING F4-½ WHEELBARROW

The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

LANSING COMPANY
LANSING, MICHIGAN

Builders of wheelbarrows for over 68 years

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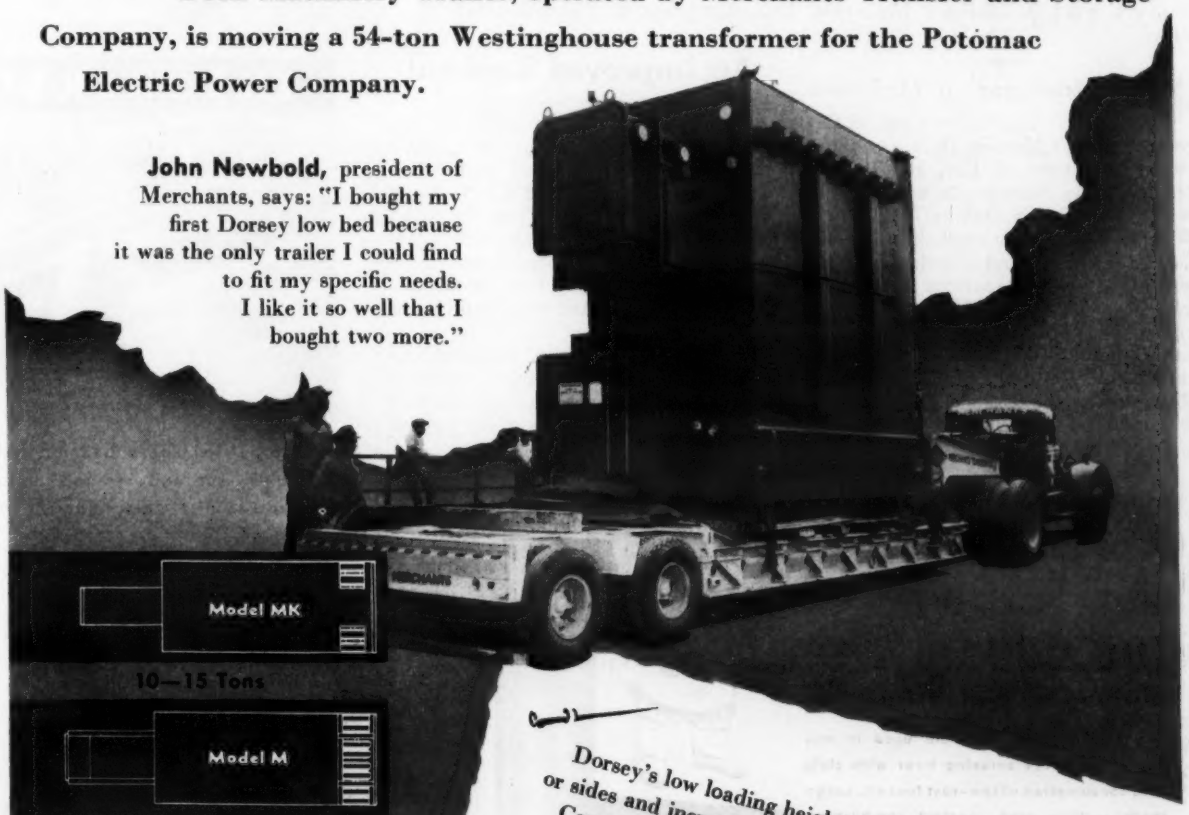
Philadelphia, Pa., Cor. N. American & Willow
Minneapolis, Minn., 326 N. First Street
San Francisco, Calif., 338-348 Brannon Street
Boston, Mass., 78 Cambridge Street
New York City, N. Y., 28-30 Vandam Street

DORSEY Low Bed Trailers

Make the Heavy Jobs Light

IN WASHINGTON, D. C., this Dorsey MT-60 Drop Deck Machinery Trailer, operated by Merchants Transfer and Storage Company, is moving a 54-ton Westinghouse transformer for the Potomac Electric Power Company.

John Newbold, president of Merchants, says: "I bought my first Dorsey low bed because it was the only trailer I could find to fit my specific needs. I like it so well that I bought two more."



Dorsey's low loading height simplifies loading from rear or sides and increases stability of top-heavy loads.

Conservative capacity ratings and oversize tires provide a wide safety margin for heavy loads . . . tire changing is simple because there is no side skirting around wheels . . . large braking areas add to the efficiency of powerfully actuated brakes.

Your Dorsey distributor will give you proof of Dorsey's safe, economical road performance . . . will explain in detail the special construction features that give you the trailer you want for any job at a *new low price.*

DORSEY TRAILERS, INC. • ELBA, ALABAMA

Sandwich Wall Panel Has Air-Glass Center

Sandwich walls consisting of a layer of Foamglas insulation held between two layers of concrete are now being more widely used for buildings where temperature and humidity control is important. Wall panels of this construction are about one-half the thickness of ordinary panels, yet the cellular glass core gives them a high insulating characteristic.

Foamglas, composed of millions of tiny glass cells or bubbles filled with air, is made by the Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh 22, Pa. Wall panels made in-the-flat permit easy placement of the Foamglas blocks. A panel with 1½-inch concrete faces and a 2-inch cellular glass core has a 3½-hour fire rating in a comparative fire test furnace using the standard ASTM time temperature curve. Although half as thick as the usual wall, its overall thermal conductivity will be approximately 0.16 Btu/hour/square foot/degree F in the 6-inch section. The cellular glass is completely impervious to moisture and thus prevents moisture-vapor migration through the wall. The thin wall offers economy in both space and weight.

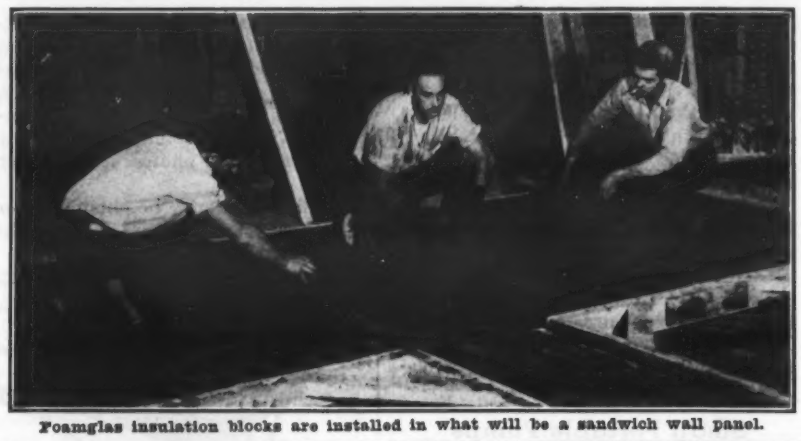
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 2.

Construction Engineering

Printed copies are available of "The Utilization of Engineering in Construction", a discussion presented at the fall meeting of the Mid-South Section, American Society of Civil Engineers, held at the University of Mississippi, October, 1948. The 36-page booklet, Bulletin No. 1, 1949, may be obtained by writing to the School of Engineering, University of Mississippi, University, Miss.

Sales Manager in Midwest

The Osgood Co. and The General Excavator Co. of Marion, Ohio, announce the appointment of Earl R. Herb as District Sales Manager in the states of North and South Dakota, Minnesota, Wisconsin, Michigan, and the northern halves of Indiana and Illinois. Mr. Herb will make his headquarters at Milwaukee, Wis., and devote his time to supervising the sales and service of Osgood and General power shovels and material-handling equipment. He will work closely with the Osgood-General distributors in his territory.



Foamglas insulation blocks are installed in what will be a sandwich wall panel.

Round Endless Belts For Small Machinery

Round endless belts have been added to the U. S. Rainbow line by the United States Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y. They are for use on drills, high-speed hammers, tappers, saws, valve refacers, woodworking tools, and other small machinery applications.

The belts are of round cross-section design, built without a splice. This construction, the company says, helps to eliminate vibration. Cord pulling members keep stretch at a minimum. Bias-cut jackets protect the inner structure and lend flexibility.

The company recommends endless round belts for quarter turn, mule, serpentine, cross drives, and many other special wheel-turning applications. They can be shifted on step-up pulleys for speed changes. The belts are available in sizes ranging from 3/16 to ½-inch belt diameter and from 6⅞ to 156 ⅜-inch inside circumference.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

An Improved Locknut

An improved locknut, consisting of a standard-steel nut and a slightly elliptical retainer ring combined in a single unit, is now manufactured by the Security Locknut Corp., 1815 N. Long Ave., Chicago 39, Ill. When the locknut is applied, the bolt forces the steel retainer back into circular shape, causing the retainer to grip the bolt threads with high pressure and resist rotation of the nut.

The nut can be applied in either direction. When the retainer grips the bolt on which the nut is applied, bolt load or stress is borne entirely by the nut, says the company. The retainer portion of the assembly is isolated from bearing contact with the nut, and is said to function solely as a lock to prevent the nut from turning.

The company claims that temperatures up to 750 degrees F have shown little or no effect on the holding power of the locknut. Security locknuts are made with national coarse and national fine threads in standard ⅜ to 2½-inch sizes.

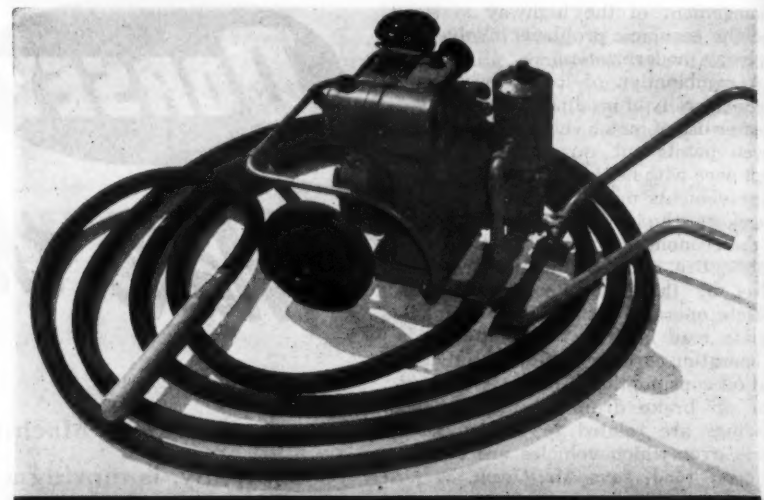
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 125.

Multiple-Drive Trucks

Catalogs on the Multi-Drive 4 x 4 and 6 x 6 motor trucks are offered by Sterling Motors Corp., Milwaukee 1, Wis. They explain that Sterling offers over 30 basic models in gross vehicle weights from 24,000 to 60,000 pounds and powered by gasoline or diesel engines.

One catalog traces the history of Sterling, showing truck models used in the first five decades of the 20th century. The other describes the characteristics and features of today's models. Exclusive feature is the Sterling wood-lined chassis frame. Drawings and photographs illustrate truck parts.

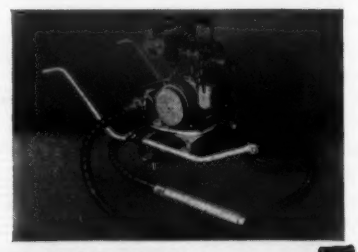
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 21.



THE JACKSON HYDRAULIC

Saves a "WHOPPING" amount of time and effort!

When you place this concrete vibrator, ***with its 50 ft. reach,*** on the job, every bit of concrete poured within a 100 ft. circle can be thoroughly vibrated without changing the location of the machine; the hard-to-get-to places become quickly accessible, non-productive time is drastically cut and the job proceeds faster and more profitably. Tough, trouble-free and highly efficient. Write for complete details.



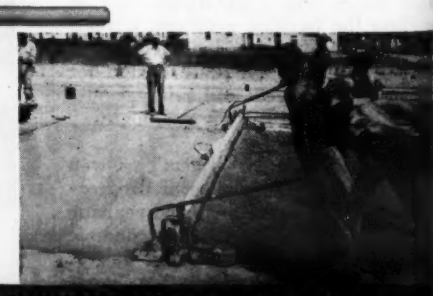
OTHER JACKSON VIBRATORS TO SOLVE EVERY VIBRATING PROBLEM — PERFECTLY!

Internal and external types — for thin sections to mass construction — highway, airport and municipal paving — product manufacture. See them at your Jackson distributor or write for literature and our recommendation for any particular type of job.

Model FS-6A. Flexible shaft, Gas-engine drive. Available with 3 heads for thick or thin sections. Flexible shafting in 7' to 14' lengths up to 28', grinding and other attachments.

Model FS-7A. Flexible shaft, Electric. Ideal for decks, thin walls and with short shafts for spud work.

MUNICIPAL PAVING UNIT. Manually guided paving machine and portable power plant. Easily places upward of 65 cu. yds. of stiff mix concrete per hour. Undercuts at side forms. Strikes off to crowns, regular and inverted; works around manholes, etc.



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HOT heat clean portable

100,000 BTU per hr.

burning ¾ gallon fuel oil!

The revolutionary principle used in this heater produces amazing heat with slow rate consumption of low-cost fuel oil. Large stack surface area, perfect combustion, places it far ahead in heating performance, economy of operation, and soot-free characteristics. One is the equal to several coke Salamanders! Simple to operate. Lights with a match. One filling burns 10-20 hours. Equipped with damper for easy extinguishing. Each individually equipped with carrying handles. Clamp arrangement on handles also secures tight cover-to-bowl fit. A distilling type heater it eliminates wicks, valves, jets, or other troublesome parts. Priced at less than $20! Distributors in all principal cities. Stock carried on hand for immediate delivery.

SCHEU PRODUCTS CO., LTD., Upland, Calif.

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Salary Plan Instituted For County Employees

Regular Monthly Salary Increases Feeling of Security; Employees Work As Maintenance Men and Each Is Responsible for His Own Route

INSTEAD of receiving time-and-a-half for overtime and double-time for Sunday, wouldn't it be better for all of us to work for a little less and be sure we'd still be working at the end of the month? Wouldn't we be better off with regular instead of irregular wages?

George W. Koronski's answer is *yes*—he's Superintendent and Engineer of Gogebic County Road Commission at Bessemer, Mich. What's more, Mr. Koronski has tried out a regular-wage, or salary, plan with his men. He reported his success with it in a paper presented at the 1949 Purdue Road School.

Wages and the State of Mind

"Wages," Mr. Koronski holds, "whether in one form or another, are solely for the purpose of keeping our bodies and souls together and to provide shelter from the inclemencies of the weather and from the attacks of all outward agencies which are ready to destroy us. Regular wages, if they are sufficient in amount, produce contentment—a regularity in living, a regularity in spending, a regularity in the peaceful thoughts of the world. Irregular wages, even though they be greatly in excess of the regular monthly wages, produce just the opposite. They produce unbalanced living and unbalanced thought, because for a short time the receiver of the irregular wage rides on the crest of the wave of success"—only to have it break and leave him stranded "for one, two, three, or four months, or even . . . a year, with no means of subsistence other than public welfare."

Moreover, the man who uses up his nervous energy worrying about a few hours of overtime pay loses the capacity to look at his work with a broad and generous view. He becomes consumed with hatreds and jealousies of fellow workers whom he suspects of shirking or cheating on hours. His feelings towards those who work for a regular wage also become warped. And this warped feeling is detrimental to the peace of the individual, his family and children, as well as to the peace of the world."

Salary Plan Formulated

Looking at the men in his own organization, Mr. Koronski often wondered what heartaches they must have endured, what a problem it must have been for them "to pay their bills when it rained for three days, two or three times a month perhaps, and they were sent home with the full dinner pail which had been so much trouble for their wives to pack. Or when they stayed up all night to fight snow storms, only to be sent home when the storm abated and was cleaned up. Or what they did years ago when they were sent home for the entire winter. Knowing how desperately I struggled to pay all the bills for my family on my regular income," he said, "I felt that if I could get the right kind of crew, or break in the crew to the right way of thinking, that the salary plan would work. . . .

"With that kind of thinking I approached the salary plan in 1936—again in 1939—again in 1941, but each time I was told by my Commissioners that it would not work. My friends, the engineers, said it would not work. It was not until 1943, when a new Commissioner was appointed who had had experience in handling labor as a member of his city commission, that I was given the go-ahead signal to try out the plan."

Plan Put Into Effect

To arrive at the salary each man was to receive, Mr. Koronski added up all of their hours of work for three years, including all of their overtime, and then struck an average wage—$5 or $10 more than they had received.

Next he called a meeting of all of his men with the Road Commission present. There he told them that they were all fired, but that if they would agree to work for a regular monthly salary instead of an irregular hourly wage, they would all be hired back—on one condition: they all must understand that they were hired primarily as maintenance men on a yearly basis and not as equipment operators, and they all were expected to be ready and willing to get on the working end of a No. 2 shovel should emergencies arise.

How the Plan Operates

To explain his salary plan and how it operates in Gogebic County, Mr. Koronski quoted from a letter written in

(*Concluded on next page*)

MUD-JACKING IS REDUCED TO ONE OPERATION with BITUCOTE

Mud-jacking has become—not only a single, simple job—but also it's the *last* time that slab needs to be leveled when it's properly done with non-volatile, safe Bitucote asphalt emulsion... It's used unheated and it's non-hazardous.

Added to the slurry, pressure-pumped under the slab, it *cures* and *dries* there as a permanent, stable, water-resistant sub-base that *forms its own seal* right to the top surface of the slab. This *seal*—plus stability and resistance to impact and compression—*stops pumping*.

Mud-jacking takes on greater practicability, safety and importance with Bitucote - stabilized slurry—and it's economical and time-saving, too.

Send for Bitucote improved procedure for one-operation mud-jacking.

Bitucote PRODUCTS Division of BRIDGES PAVING CO.

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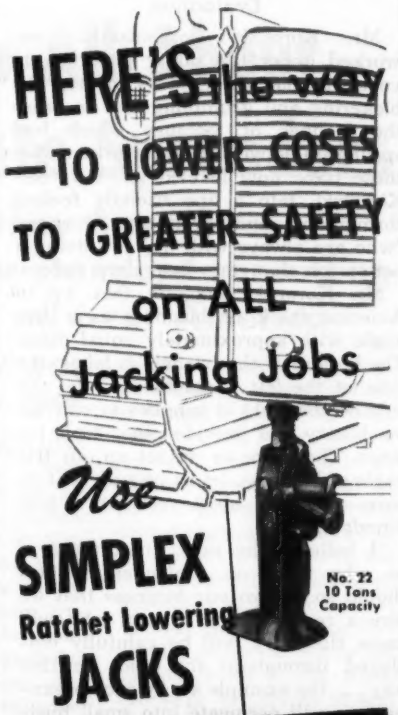
Plants: Cincinnati, O. • St. Louis, Mo. • El Dorado, Ark. • Buffalo, N.Y.



SAFER, FASTER ACTION

SAVES TIME AND MANPOWER

● Maximum power and safety! Easier, faster operation! Greater versatility! Longer service! These are the qualities that put Simplex Ratchet Lowering Jacks at the top of the list today for industries that must save — safely — on repair and maintenance jacking. All models lift full capacity *on the cap or on the toe*. Capacities from 1½ to 35 tons. Send for Bulletin: Industrial 49.

NEW DESIGN! NEW EFFICIENCY!

SIMPLEX HYDRAULIC JACKS

Model 12HJ 12 Tons Capacity

Here's easy acting, *safe* hydraulic jacking power. Simplex Hydraulic Jacks operate in either horizontal or vertical position; are easily portable and produce maximum power at minimum weight. Eight models. Capacities 3 to 100 tons — all safety tested to 50% over rated load. Send for Bulletin: Hydraulic 48.

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DISTINGUISHED...
by Superior Quality
*"AIR KING"
Quick-Acting, Universal
HOSE COUPLING
Comparison with similar couplings lies in general appearance, alone. Service-tested materials, precision manufacture and careful inspection assure unrivaled performance under all conditions. Malleable iron, cadmium plated, or bronze.
Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.
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Main Office and Factory: PHILADELPHIA 22, PA.

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Want to Sell or Buy Used Equipment?

Need experienced help?

Have a position open?

Send your copy to The Trading Post Contractors & Engineers Monthly, 470 Fourth Ave., New York 16, N.Y.

A New Salary Plan For County Workers

(*Continued from preceding page*)

1947 by the President of the Gogebic County employees' organization in answer to an inquiry from another county:

"We do not have any contract but just a gentlemen's agreement, and the money which we would pay to the union goes into our Emergency Hospitalization plan which we started last May. . . .

"Briefly, we work on a basis of 40 hours a week or 2,080 hours a year. Then we have six holidays with pay—Christmas, New Year's, Memorial Day, Fourth of July, Labor Day, and Thanksgiving. Then if the weather is right we get Little Christmas—the day after Christmas. But we understand that even on these days if the weather calls, we must work.

"The management never attends the meetings of the Club although they are members. Mr. Koronski says the reason he doesn't attend is to allow the men to express their own opinions which they probably would not do if Mr. Koronski attended. However, where important decisions are made affecting the men and organization, then the entire Board of County Road Commisisoners meet with the men.

"Our only crab now is that due to the rising cost of living, we are not paid enough and we feel that we should receive $20 to $25 more a month as a cost-of-living adjustment, but I understand that the Board of County Road Commissioners have put their compensation reserve of $12,000.00 into the general fund in order to pay our wages this month.

"We feel sure and have that assurance from Mr. Koronski that our wages will be raised as soon as possible.

"We have a timekeeper who keeps a record of our entire year's work, when we work, when we are off, for what reason we are off, and what extra time we work. We are then given that time off when weather permits.

"The first week of deer season is like a holiday around here. Many fellows save their vacation for deer season and then everyone, perhaps, has an extra day coming due to overtime, but we all go with the understanding that if it snows we will return to our route.

"Each man is assigned to one specific route for the winter and he is responsible for the condition of that route. I may mention here that so far when a man has been sick, really sick, and the two weeks' sick leave expired, the management has extended his sick leave. This is what it means to have a friendly and understanding Superintendent.

"In all, I think we have the finest organization of any Road Commission in the State and our only present crab, as I stated before, is that we need $20 to $25 a month raise in wages.

"Our wage scale is as follows for 160 hours a month:

	1947
Truck driver—light and heavy	$175.00
Heavy-grader operators and shovel operators	$186.00
Mechanics	$197.00
Labor	$155.00"

Since this letter was written the wage scale has been increased as shown in the following table:

	1949
Truck driver—light and heavy	$200.00
Heavy grader operators	$215.00
Shovel operators	$220.00
Mechanics	$220.00
Labor	$175.00

Evaluation

Mr. Koronski's organization has worked under the salary plan for six years. It took three years to stop the bickering and grumbling and to erase the feelings of jealousy which had sprung up between fellow workers. But these have now leveled off, says Mr. Koronski, into a fine friendly feeling throughout, and even the shirkers, "who are always with us," are doing a better job than they had done before.

Mr. Koronski suggests that we in America think of business as a triangle with approximately equal sides. The bottom of the triangle is labor, the side on the left is machinery, and the side on the right is supplies to run the machinery and provide other tools for labor. Therefore, as we set up our triangle of business, let us be sure that its base, which is labor, rests on a firm foundation.

"I believe," he says, "that those of us who work on controlled budgets should so govern our business that we hire a regular crew of men who will know that they will be gainfully employed throughout the year. In that way . . . the example set by such organizations will permeate into small businesses and from there into larger businesses, until all of the laboring class of the United States is so gainfully employed."

The Joy Sulmet rock bit ranges from 1⅜ to 2¼ inch in size.

Rock-Drilling Bit

Development of a new Sulmet rock bit, designed for general drilling application, has been announced by the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. It is a skirt-type bit of the four-point cross design, with tungsten carbide inserts for maximum penetration. Present available sizes are 1⅜, 1½, 1⅝, 1¾, and 2¼-inch. Other sizes will be available later.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 27.

Operating-Cost Guide For Cranes and Shovels

The Power Crane & Shovel Association, 74 Trinity Place, New York 6, N. Y., has just released an operating-cost guide bulletin to help owners of power cranes and shovels estimate the cost of owning, operating, and maintaining this type of equipment. Members of the Association collaborated in order to present in this bulletin a clear and rational approach to the subject of cost determination.

Aside from being of value to construction-equipment owners, this breakdown of costs will probably be of interest to contracting engineers, cost estimators, highway and public-works administrators, plant and material-handling engineers, and engineering students majoring in construction methods and equipment.

Copies of Technical Bulletin No. 2 may be obtained for 50 cents each by writing to the Association. Complimentary copies will be furnished to engineering schools and colleges.

Stormy Weather!

When it rains you can't wait to experiment with untried tarps. You can depend on ECCO tarpaulins when you need them. Hundreds of other builders and contractors have used ECCO tarps for many years.

ECCO

- Seals out wind, rain and snow
- Big 2-inch hems and double-sewn seams
- Rustproof grommets and long tie ropes
- Economical, give years of service
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Write for prices on your requirements

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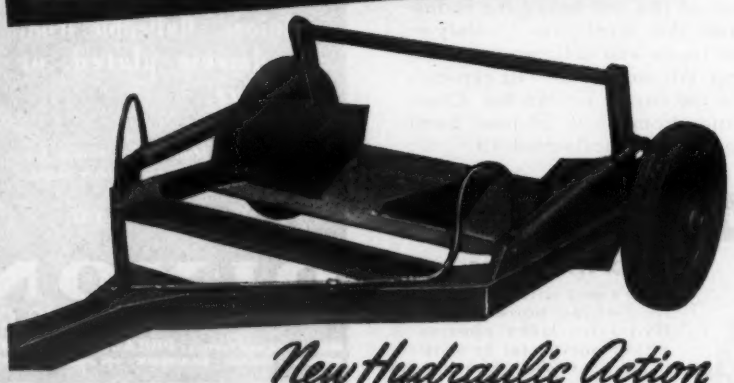
LEVELS and FILLS at LESS COST



New Hydraulic Action

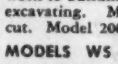
SOIL MOVER

4-MODELS!

MODELS WR 100 & 200

Wheels behind and inside frame for close work to buildings, ditches and excavating. Model 100-54" cut. Model 200-72" cut.

MODELS WS 100 & 200



Wheels on side of bucket. Wide variety of uses. Ideal for filling in foundations. Model 100-54" cut. Model 200-72" cut.

It Loads . . . It Carries . . . It Dumps . . . without Stopping! FASTER . . . EASIER!

Carry the load . . . don't drag it. Bucket dumps backwards for easier load spotting and leveling. Makes it easier to fill those hard-to-get-at places.

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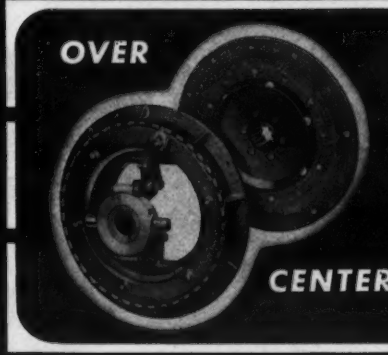

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Analysing the Problem
Designing the Clutch
Planning Production
Tooling Up
Manufacturing
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Supervising Installation
Servicing

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BORG-WARNER
314 Catherine Street, Rockford, Illinois

Locomotive Crane Is Light-Work Diesel

A new 10-ton diesel locomotive crane, Model 410, has been introduced by American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn. It offers light weight, moderate first cost, and efficient operation, the company says. It is engineered for high-speed work and for use on lighter jobs where the use of a larger crane would be less economical.

Powered by an electric-starting diesel engine which develops 72 hp at 1,600 rpm, it has a rated capacity of 20,000 pounds with a 40-foot boom at 12-foot radius. It has a full-vision cab, and tandem band air-controlled clutches, and will perform all operations simultaneously. The machinery deck is compactly arranged with all units easily accessible, says the manufacturer.

Other design features include welded construction throughout, ball and roller bearings, precision-cut gears running in oil, and a quick-action boom hoist under positive control at all times.

The 3-speed selective transmission allows shifting from one speed to another while the crane is in motion. Travel speeds in the respective ratios are 2.25, 8.0, and 15 mph; drawbar pulls are 8,160, 2,060, and 950 pounds. The Model 410 has a 7,500-pound single-line hoisting pull at 235 rpm. Slewing speed is 2.5 rpm.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 59.

Manual AC Starters

A new line of manually operated starters for ac motors up to 7½ hp has been announced by General Electric, Schenectady 5, N. Y. The starters are furnished in both toggle and push-button types in 2, 3, and 4-pole forms, size 0 and 1. The toggle-operated types are also furnished, if desired, with cast-iron enclosures for use in wet, dust-laden, or hazardous locations.

A feature of these starters is their bimetallic overload protection, which replaces the solder-pot relay and provides accurate response to overloads. The starters are equipped with a wide range of heaters, all of which follow closely the motor heating curve. To prevent tampering, all starters in general-purpose enclosures can be padlocked. All live parts are mounted on a strong molded base of high insulating quality.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

Folders on Tandem Rollers

Four-page folders on Essick ball-bearing rollers, with weights of 1½ to 5 tons, are available from the Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif. The folders cover Models 200, 300, 400, and 500 rollers with maximum compressions of 108, 145, 160, and 200 psi respectively. Dimensions, specifications, and features of these rollers are included.

Essick rollers are equipped with a specially engineered two-speed totally enclosed transmission and have multiple-disk clutches for changing direction of travel. All bearings in the transmission are either ball or roller type; all gears are machine cut and hardened. The transmission is integral with the engine. The catalogs also point out that trailers for all models of rollers are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 162.

The American Model 410 locomotive crane is a 10-ton diesel unit for high-speed light work.

Catalog on Instruments For Plant and Laboratory

A complete selection guide for plant and laboratory instruments is offered in a 40-page catalog issued by the H-B Instrument Co., 2633 Trenton Ave., Philadelphia 25, Pa. Complete cross-indexing and systematic layout make it easy to find instruments suited to individual needs.

Instruments illustrated and described include etched-stem glass thermometers with ranges from minus 120 degrees F or C up to 1,160 degrees F or 620 degrees C; armored thermometers, ASTM, and many other special-use thermometers; industrial thermometers for permanent installation or intermittent batch use; psychrometers; thermo-regulators; mercury-plunger relays; hydrometers, with and without thermometers, guaranteed to have tolerances within limits established by the National Bureau of Standards; specific-gravity or Baumé scales; and many other specific-use scales. A simplified price list is included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 150.

This Tells You All About FLINK Tail-Gate Spreaders

Nationwide Sales-Service

Alleg'y Eq. Corp., Pitts.
C. J. Blackwell, Horseheads, N. Y.
R. W. Bleiler, Eq. Co., West Hartford, Conn.
J. F. Brittain, Erie, Pa.
Credle Eq., Utica
Dyar Sales & Mach. Co., Cambridge, Mass.
Eastern Eq. Sales, Springfield, Mass.
Files & O'Keefe, Portland, Maine
Gen. Supply Eq., Baltimore, Md.
Hodge-Mattheis Co., Providence, R. I.
Hiway Co., Harrisburg
Laurion Eq., Montreal
Municipal Mach., Coram, New York
N'fdl'd Tractor Eq., St. John's, N. B.
No. Jersey Eq., Newark
Rish Eq., Charleston
Rish Eq., Clarksburg
Rish Eq., Richmond
Rish Eq., Roanoke

Tri-State Eq., Wilmington
G. W. Whitehead, Buffalo
Chostaw, Memphis, Tenn.
G. W. Clements, Columbus, Ohio
Conwell Eq., Davenport, Ia.
Dealers Eq., Peoria, Ill.
4-Wheel Drive Auto Co., Clintonville, Wis.
C. C. Fuller, Chicago, Ill.
K. C. Giffen, Toronto, Ont.
H'way Eq., Lincoln, Neb.
Korte Bros., Ft. Wayne, Indiana
Malotte Co., Petersburg, Indiana
Nat'l Eq., Louisville, Ky.
Pigott T & T, Winnipeg, Manitoba
Rish Eq., Cincinnati
Tulsa Corp., Tulsa, Okla.
Rosenwald-Cooper, St. Paul
J. A. Sugg, Morganfield, Kentucky
Telford Eq., Lansing, Michigan
Telford Eq., Detroit, Michigan
E. W. Werner, Mt. Vernon, Illinois
Wis. Oil Eq., Oshkosh, Wisconsin
Wis. Oil Eq., Kan. City, Missouri
A. H. Cox, Seattle, Wash.
4-Wheel Drive Pac., Los Angeles, Calif.
4-Wheel Drive Pac., San Francisco, Calif.
Kimball Eq., Salt Lake City
Liberty Truck, Denver
Mont. Powder Eq., Helena
Western Eq., Boise, Idaho

And why they have been accepted as standard spreading equipment all over America

FOR ICE CONTROL AND ROAD WORK

Thousands of Transportation Companies, States, Cities, Counties and Townships, all over the country, use FLINK Tail-Gate Spreaders for fast, efficient spreading with present dump truck equipment. This self-feeding, hydraulic-drive spreader handles all types of granular material — sand, chips, cinders, salt, calcium chloride, chat, etc.,—wet or dry, evenly and without bridging or clogging. Quickly adjustable to spread backward or forward. Forward spread for ice control. Backward spread for re-surfacing and seal coating, so tires ride on material spread. Spreads from width of truck to width of street—thick or thin. One FLINK equipped truck will do the work of several ordinary trucks.

FITS ANY DUMP TRUCK

FLINK Spreaders do not limit trucks to spreading only. Fits your present truck as a replacement end-gate so truck can be used for all hauling purposes. Doesn't interfere with dumping. Installs in a few hours without special tools. Removes from truck in same manner as regular end-gate.

THROWS AT LOW LEVEL

FLINK introduced the principle of throwing at low level —with material thrown forward and down toward base of wheels — providing traction for truck and making it possible to cover both lanes without getting material on parked, passing or following cars — especially valuable in ice control. Driven with the finest hydraulic equipment, proved by extensive tests at Armour Research. This hydraulic power is controlled by the driver in the truck cab. May be thrown in and out of action without stopping. Automatic gate control. Spreads at 2 to 30 miles an hour. Covers more surface with less material in less time—to get more hours of productive work from truck and driver. Reduces number of trucks and men.

MORE EFFICIENT SPREAD

The patented feeder rotors and distributor blades of the FLINK Spreader assure a positive, uniform spread. No thick or thin spots. Material goes farther because it is spread in proper quantity only where needed.

FLINK DEPENDABILITY

Long lists of users, nationally recognized for their care in purchasing equipment, are evidence to the outstanding dependability, economy and efficiency of the FLINK Spreader. Established in 1929, the FLINK Company is represented throughout the country by the best known jobbers in the ice control field. Prove to yourself the superiority of the FLINK Tail-Gate Spreader. Contact your nearest FLINK representative or the Factory.

FLINK CO.

Dept. 3-S

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CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
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1737 Farragut Ave. Chicago 40, Ill.

HOW TO DO MORE WORK PER MAN..PER MACHINE

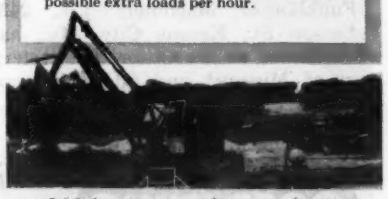
MINNEAPOLIS MOLINE
MM
MODERN MACHINERY

INDUSTRIAL WHEELERS

Greater speed and ease of handling make MM Industrial Wheelers the natural choice for economy handling of construction and maintenance jobs. A complete selection of attaching or pull type equipment provides a wide range of job application.

Save Time On The Job . . . On The Road . . . Deliver More Loads Per Hour.

The "shuttle gear" for fast reversing . . . "roller steering" that makes easier handling of any load . . . enable MM Industrial Wheelers to handle more loads per hour on loading and dozing jobs with less operator fatigue. New UTIL "shuttle gear" actually gives an operator a choice of *6 forward* and *6 reverse speeds*. Speeds up to 14.5 m.p.h. save time on the job as well as road time between jobs. The "straight-line" principal used in "shuttle gear" shifting eliminates slow gear shifting, doubles the time saved and makes possible extra loads per hour.



Original equipment manufacturers prefer MM Industrial Wheelers and Power Units for their economy, dependability and ease of servicing.

SEE YOUR MM DEALER-DISTRIBUTOR OR WRITE

MINNEAPOLIS-MOLINE
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Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
NATIONAL DISTRIBUTION BY
WM. H. ZIEGLER CO., INC.
2929 University Ave. S. E., Minneapolis 14, Minn.

Distributor Doings

Spray-Bar Distributorships Open

The Fraco Mfg. Co., Box 387, Richwood, Ohio, announces that some dealerships for its full circulating spray bar, made to fit all oil, tar, or asphalt distributors, are still available.

Six Lima Shovel & Crane Dealers

The Lima Shovel & Crane Division, Lima-Hamilton Corp., Lima, Ohio, has appointed six new distributors for its line of power shovels, cranes, and draglines.

The Flack Equipment Co., P. O. Box 1526, Toledo 4, Ohio, will cover the Toledo sales area; John C. Louis Co., Inc., 511 W. Platt St., Baltimore, Md., will serve the District of Columbia; the state of Maryland; Delaware with the exception of New Castle County; and the Counties of Arlington, Fairfax, and Loudoun in Virginia. The Buran Equipment Co., 777—100th Ave., Oakland, Calif., will represent Lima in northern California. Metalweld, Inc., 26th and Hunting Park Ave., Philadelphia 29, Pa., will cover the Philadelphia sales area. Scott Machinery Co., 84 S. Main St., Concord, N. H., will serve New Hampshire, and Stockberger-Seastrom, Inc., 2200 N. Mannheim Road, Melrose Park, Ill., will cover the Chicago area.

James A. Ring Dies

James A. Ring died recently. He was Missoula Branch Manager of Western Construction Equipment Co., Heil distributor at Billings, Mont.

Howell Co. Handles Motor Graders

Distributorship of Warco motor graders in the Chicago and northwest Indiana territory has been awarded to the L. Z. Howell Co., 2620 S. Parkway, Chicago, Ill., by the W. A. Riddell Corp., Bucyrus, Ohio.

New Acrow Distributors Appointed

Acrow, Inc., manufacturer of adjustable steel shores, column clamps, trench jacks, etc., has appointed distributors to handle its products in the south-central and midwestern states.

Funkhouser Machinery Co., 2425 Jefferson St., Kansas City, Mo., has been named as dealer for the western part of Missouri and all of Kansas. Townsco Equipment Co., 1704 N. W. 6th St., Oklahoma City, Okla., has been appointed distributor for the state of Oklahoma. G. F. Smith Co., Inc., 5215 Manchester Ave., St. Louis, Mo., will handle Acrow products in the eastern part of Missouri and the southern part of Illinois. Lauren Burt, Inc., 3254 Walnut St., Denver, Colo., will cover the states of Colorado and Wyoming.

Joe Money Seeks Governorship

Joe Money, President of the machinery company bearing his name, has definitely tossed his hat in the ring for the 1950 gubernatorial election in Alabama. Mr. Money, widely known Birmingham businessman and chief executive of the Joe Money Machinery Co., has been in touch with supporters in all 67 counties and is gratified and encouraged by assurances of aid from many quarters. Though it is too early for formal announcements, Mr. Money says that he has positive intention to become a candidate for Governor of Alabama in the Democratic primaries next year.

Dealerships Open for New Spreader

Dealerships are now being set up for a new combination tail-gate spreader for ice control and seal-coat work. Recently developed by the Century Engineering Co. of Waukesha, Wis., the unit is completely hydraulic and one-man operated. The spreader will be sold nationally through distributors by Paul M. Cole Co., 30 N. La Salle St., Chicago 2, Ill., to whom requests for distributorship information may be addressed.

Will Handle Protective Coatings

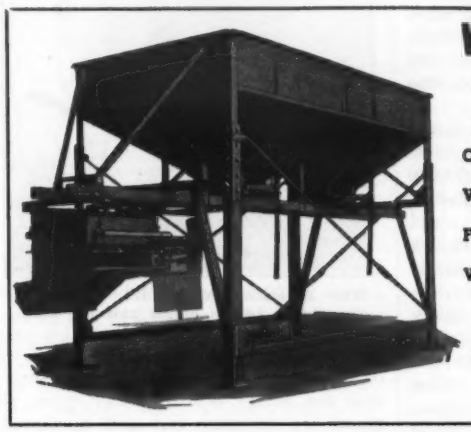
The S. D. Day Co., Houston, Texas, has been appointed southwest representative for the Pittsburgh Coke & Chemical Co. protective pipe-line coatings. Mr. Day has been a practical student of pipe-line corrosion for over 20 years.

Euclid Changes Representatives

The Euclid Road Machinery Co., Cleveland, Ohio, announces that changes were recently made in its distributor organization. Euclid-Kentucky, Inc., 3900 Crittenden Drive, Louisville, Ky., has taken over the distributorship for the state of Kentucky, replacing Brandeis Machinery & Supply Co., Inc. Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis, has been assigned the southern Indiana territory formerly served by Brandeis. Euclid Sales & Service, Inc., 5231 Manchester Ave., St. Louis 10, Mo., will take over the southern Illinois counties previously covered by Brandeis.

Clark-Wilcox Co., 118 Western Ave., Boston 34, Mass., has been assigned the state of Maine, formerly covered by

(*Concluded on next page*)



Winslow BINANBATCH

—Reduces Your Job Cost

Use with a

10S - 11S - 14S - 16S Mixer

Complete—with scale for two or three aggregates.

With two or three overhead storage bins.

For use on culvert—bridge—curbing—foundation jobs.

Wherever above size mixers are in operation.

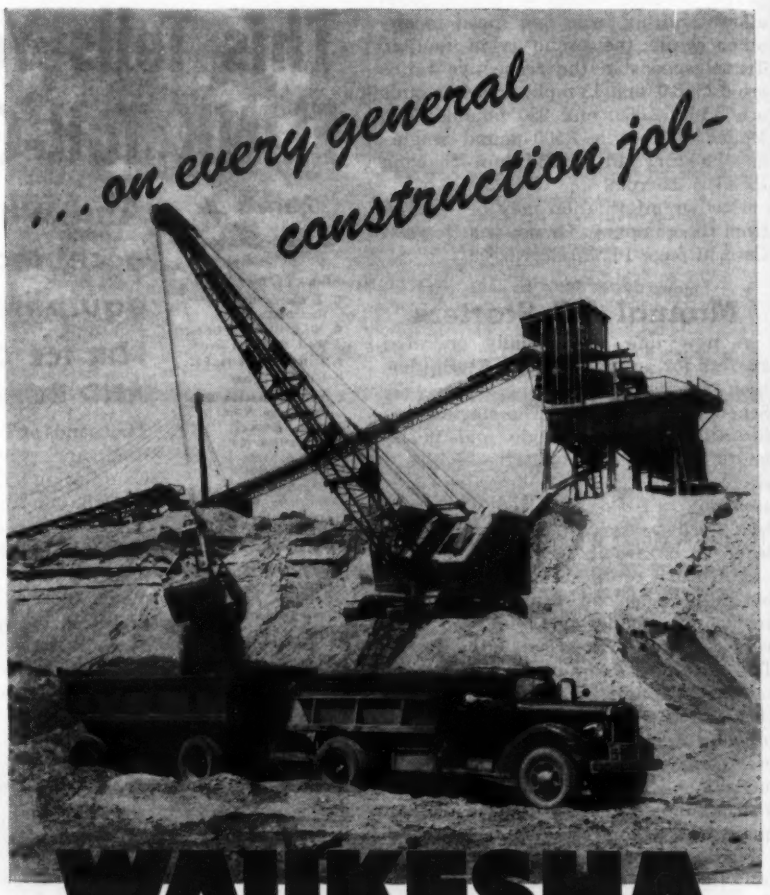
PROMPT DELIVERY — WRITE OR WIRE

Mfrd. by

WINSLOW SCALE CO.

TERRE HAUTE, IND.

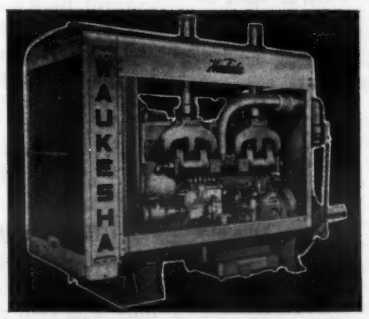
Distributors Located throughout U.S.



WAUKESHA

Diesel

POWER UNITS



WAUKESHA Super-Duty DIESEL (6-WAKDU) six cylinders, 6¼-in. x 6½ in., 1197 cu. in. displacement, 210 hp. maximum

WHY are Waukesha Diesels so specially adapted to the general contractor's needs—for powering rock crushing, gravel screening-washing machinery, conveyors, shovels, cranes, pumps, mixers, pavers, hoists, and portable compressors and generators . . .

Outstandingly lively pick-up . . . quick response to power demand . . . high economy . . . ability to burn cleanly all modern "high speed Diesel fuels" of 45 cetane or above . . . starts easily . . . runs smoothly . . . maintenance is simpler and costs less . . . and Waukesha Diesels are easy to understand and operate. They range all the way from the small four-cylinder with a maximum of 29 hp., to the largest six-cylinder with its 357 hp. maximum. Bulletin 1418 tells you how Waukesha builds dependability into these Diesels—send for it.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

SLASH OPERATING COSTS...

with *Tel-E-Lect* POLE LINE EQUIPMENT

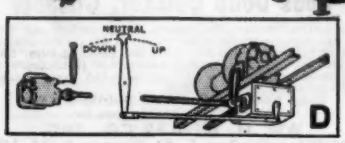
For installation on your present truck—or on new equipment

A **POLE HOLE DIGGER** . . . Uses your regular derrick and crew. Attaches by a single bolt to power take-off shaft. Adjustable for clean holes up to 10 feet deep. Interchangeable augers 8 to 20 inches diameter.

B **DERRICKS** . . . Both "A" frame and "T" type for front or rear mounting on all makes of trucks.

C **UTILITY CABINETS AND MATERIAL RACKS** . . . Bolts onto any flat bed truck. Gives needed facilities for pole line work at a fraction of the cost of a utility body.

D **WINCH DRIVE BOX** . . . Gives instant forward and reverse action to your winch. Permits operator to give all his attention to the winch job and speeds up work. *Easy to operate:* Simply engage power take-off just once. No further shifting to PTO or use of truck clutch required. Just move a single cab lever forward or backward to lower or raise the winch line. Available for single or double drum winches.



For literature or demonstration, write to

TEL-E-LECT PRODUCTS, INC.

10033 MINNETONKA BLVD. • MINNEAPOLIS 16, MINN.

Distributor Doings

(Continued from preceding page)

Eastern Tractor & Equipment Co., plus the state of Vermont. It also covers Rhode Island, counties east of and including Worcester in Massachusetts, and several counties in the state of New Hampshire.

M. D. Moody, Florida Dealer, Dies

Maxey D. Moody, one of the oldest construction equipment men in Florida, and one of the founders of ARBA, succumbed to a heart attack at his home in Jacksonville at the age of 65. He had been head of M. D. Moody & Sons, distributor of construction machinery, for 31 years.

Symons Clamp Co. Wants Dealers

The Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill., is interested in securing several new distributors for its column clamps and shores, generally available for the first time since before the war, and for its new forming system which includes forms, form ties, and form hardware.

Marion Appoints Detroit Dealer

Depco Detroit Corp. has been appointed Marion Power Shovel Co. distributor for all of the lower peninsula of Michigan, with the exception of several counties in the southwest corner of the state. The concern maintains sales offices at 2914 Book Tower, Detroit, and parts and service facilities at 12756 Southfield, Detroit. Depco will represent Marion in clutch-type machines, Types 33-M through 111-M. It also serves as distributor of contractors' equipment for eight other prominent manufacturers.

Borg-Warner Dealer for Canada

Borg-Warner automotive replacement parts will be distributed throughout Canada by the recently formed B-W-H Service Parts, Ltd., of Merritton, Ontario. This company will take over the Borg-Warner parts inventory of Acton Machine Co. of Toronto.

J. W. Primeau has been elected President of the new firm. Other officers are J. W. DeLind, Jr., Vice President, and E. P. McGavin, Secretary-Treasurer. J. E. Gammage has been appointed General Manager and L. J. Easterbrook has been named Sales Manager. The Board of Directors will consist of Messrs. Primeau, DeLind, Gammage, McGavin, and R. W. Dose, who is Assistant Secretary and Assistant Treasurer of Borg-Warner Corp.

American Road Builders Will Meet in Cincinnati

Cincinnati has been chosen for the 47th annual meeting of the American Road Builders' Association next March 6 to 9, it was announced by Charles M. Upham, its Engineer-Director.

With an expected attendance of more than 1,000, the four-day session will be held in Cincinnati's Netherlands Plaza Hotel. Engineers, contractors, highway officials, manufacturers, and others prominent in the highway industry will attend technical and other meetings.

The board of directors of the ARBA will meet at that time, as well as the boards of its several divisions: county highway officials, airport, highway contractors, municipal, and manufacturers. Papers on highway construction, maintenance, and financing will be the main feature of the annual conclave.

Steel-Column Literature; A Survey and Appraisal

"Steel Columns—A Survey and Appraisal of Past Works", by A. A. Jakkula, Executive Director of the Texas A & M Research Foundation, and Henson K. Stephenson, Research Engineer at the Texas Engineering Experiment Station, is a publication resulting from a cooperative investigation of bridge types by the Public Roads Administration and the Agricultural and Mechanical College of Texas. This pamphlet presents an up-to-date bibliography and review of literature on the development and design of columns and other compression members.

This booklet may be obtained from the Texas Engineering Experiment Station, The Texas A & M College System, College Station, Texas, by requesting Bulletin 91. Single copies are free on request.

Water-Hose Catalog

A new catalog covering a line of industrial, commercial, and general-purpose water hose has been issued by the New York Belting & Packing Co., 1 Market St., Passaic, N. J. Included in it are helpful data on the construction, maintenance, and use of water hose and water suction hose manufactured by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 118.

Steel Sheet Piling

Detailed discussion of the uses, characteristics, and assembly of the three general types of U.S.S. steel sheet piling sections—the straight web, the arch web, and Z-piles—are covered in a 58-page booklet prepared by the Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 30, Pa.

Following this discussion are complete tables of wall dimensions, cellular structures, accessories, and weights for all sections, plus diagrams of the individual sections, walls, corners, cellular structures, cofferdams, bulkhead and piers, and caps or copings.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 139.

Sales Mgrs. for Bearings

The Tyson Bearing Corp. of Massillon, Ohio, has announced the appointment of George M. Lange as Regional Sales Manager for the midwest area. Robert R. Flaisig, formerly a Tyson inspector and metallurgist, and until recently a special representative of the company, has been designated Regional Sales Manager for the eastern territory.

The Michigan-Ohio territory will be serviced direct from the factory under the supervision of the Assistant Sales Manager, Ivan C. Mann.

Here's the new

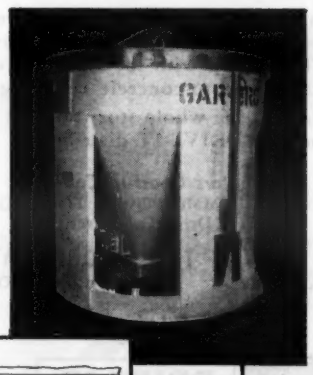
CON-VAY-IT Concrete Special!

It's unsurpassed in its ability to speed up the movement of wet concrete from mixer to forms. With CON-VAY-IT Special you'll **pour concrete faster**, and at but a fraction of your normal labor cost. Available with either gas engine or electric motor drive.

Construction men in all parts of the country are using this highly efficient Concrete Conveyor with great success . . . and claim it has saved them many thousands of dollars annually. You should know about CON-VAY-IT Special — write for details TODAY.

AMERICAN CONVEYOR CO. 1115 WEST ADAMS STREET CHICAGO 7, ILLINOIS

tough GAR-BRO concrete buckets

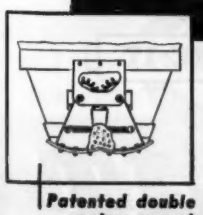


for every placing need

- Heavy Duty—with large manual or air operated gates for Dam construction.
- Medium Duty—for strict concrete specifications on heavy construction.
- Lightweight Buckets—for general construction work.
- Laydown Buckets—for use with truck mixers or other low loading height requirements.

GAR-BRO BUCKETS SAVE TIME AND MONEY IN ANY JOB OF CONCRETE PLACING

Catalog #75-B gives complete specifications on all GAR-BRO buckets. Write for your free copy now.



GAR-BRO Standard Heavy Duty bucket, built in 6 sizes.

Patented double clamshell gates, non-clogging, self-closing, grout-tight.

GAR-BRO MANUFACTURING COMPANY 2416 E. 16th ST. LOS ANGELES 21

LITTLEFORD model no. 101 UTILITY SPRAY TANKS

takes the place of three units

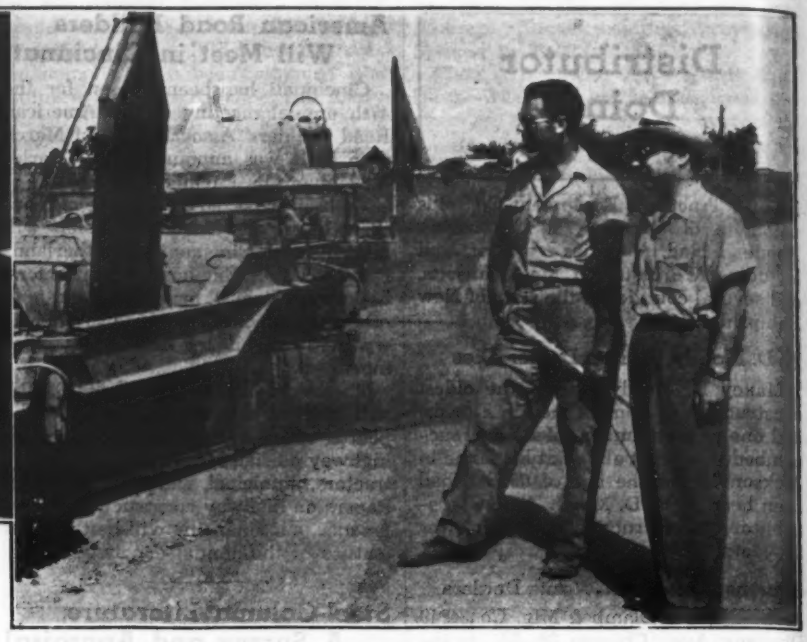
FOR A UTILITY UNIT to do Road Maintenance work the Littleford No. 101 was designed to do just that. Here's an outfit that can do the work of three units—it has a spray bar for doing small application jobs, a hand spray attachment for doing patch work and a pouring pot outlet for doing patch work or crack filling. This 101 Unit has a fast heating system including U type heat flues with Littleford Vaporizing Torch Burners. The No. 101 will handle Asphalt, Tar, Emulsion, Road Oils or Cutback. Made in sizes to fit any road maintenance job. For further details see your nearest Littleford distributor.

MANUFACTURERS OF "Tankar" Steam Heaters, "Kwik-Melter" Roofers Kettles, Trail-O-Rollers, "Spray Master" Pressure Distributors, Highway Brooms, Tool Heaters, Trail-O-Distributors

LB LITTLEFORD — BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900

Asphalt Supply Tanks, No. 101 Utility Spray Tanks, 84-HD Asphalt Kettles

LITTLEFORD BROS., Inc. 485 East Pearl St., Cincinnati 2, Ohio



C. & E. M. Photos

Cahit Ozgen, Turkish highway engineer, (at right in the photo above), pays a visit to Missouri's Chief Engineer Carl Brown (center) and Rex M. Whitton, Engineer of Maintenance. They are preparing a field trip . . . as part of it Ozgen (at right in the second photo) watches a Wood self-propelled Roadmixer at work.

Turkey and Missouri Compare Road Methods

Turkish Road Maintenance Expert Studies the Maintenance Methods Of Missouri Highway System

✦ "PUT the scimitar away, Ali. We won't behead the maintenance foreman until next week!"

If you believe that sentence could have been uttered in the Highway Department of Turkey, you are wrong, according to Cahit Ozgen, Assistant Highway Maintenance Engineer for the Turkish Government recently studying highway methods in this country. For Turkey has some excellent highways, and plans to develop more very soon.

That is why Ozgen was in the United States. He was in Missouri because Deputy Commissioner H. E. Hilts of the Washington Office of the Bureau of Public Roads told him that the highway problems of Missouri simulated very nearly the conditions of Ozgen's own country. Driving across the Missouri River bottomlands and low hills near Hermann, in Gasconade County, Ozgen exclaimed "This is just like home!"

Ozgen, a member of a 5-man engineering delegation visiting highway departments in this country, was studying materials, methods, equipment and its use, office procedure, and as much other detail as he could cram into a 4-month visit. The other 4 Turks were studying the Kansas and Texas highway departments. Two laboratory engineers were also in the U. S., but they were reviewing laboratory procedure in the BPR facilities in Washington.

Is Favorably Impressed

"I'm impressed most by the manufacturing industries in your country which undoubtedly helped push your road program," Ozgen said in English just as good as the words are written. "In my country we are just now starting where you were 20 years ago."

Ozgen revealed that there are over 15,000 kilometers of roads in Turkey, which covers an area about 20 per cent larger than Texas. About 9,000 kilometers are now under active maintenance, and the remaining portion is shortly to be developed from graded earth trails to modern 2-lane roads. Standards are being set up for a roadbed 9 meters wide, with the riding surface 6 meters.

These highways cross Turkey approximately the same as the north-south and east-west highways in this

(Concluded on next page)

from CONNECTICUT TO TEXAS in record time!

THEY DID IT with the help of DRIVE-IT the safe, modern fastening system!

CHANCE VOUGHT AIRCRAFT PLANT • DALLAS, TEXAS

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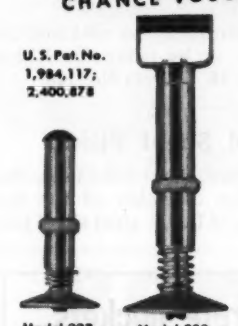

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country connect the main centers of population and industry, and are now being similarly marked. They are marked with numbers, so tourists will easily find their way on Highway D.Y.1 connecting Edirne, Istanbul, Ankara, and Iskenderun going from Europe to the near East.

Most of the Turkish highways are made of waterbound macadam and gravel. Minimum standards for first-line roads call for a base course of 3-inch-maximum crushed rock about 20 centimeters deep and sometimes a Telford base placed by hand, and a topping course of the 2-inch size 15 centimeters thick.

During past years, about 2,000 employees maintained the highways by hand methods, with small equipment. Marshall Plan aid is now reaching Turkey, however, and a great deal of American equipment is being brought in. This equipment includes the same machines commonly seen here: motor graders, rock crushing-screening plants, loaders, tractors and bulldozers, power shovels and draglines. More than $5,000,000 worth was received in the past two years.

The arrival of that equipment will signal the start of one of the greatest road-building programs Turkey has seen. In the next two years, Turkey will have a national highway system of 23,000 kilometers which will serve the public every season of the year. Already experienced Turkish operators are training other men to run the equipment, and foreign engineering experts from the United States are directing the plans and surveys, and showing how to use the equipment economically.

The maintenance set up now divides Turkey into 10 division offices, each with from 4 to 6 districts. The districts are sub-divided into sections, similar to many departments in this country, and the patrol system of maintenance is employed.

While there are practically all makes of automobiles in Turkey, from American to British, Italian, and German cars, most of the highway traffic is still truck hauling, carrying supplies from the seaports into the interior. The highway between Ankara and Istanbul carries about 200 vehicles per day at this time, and that number will slowly increase, Ozgen believes.

"But we won't duplicate California traffic for some time," he smiled.

Ozgen, an affable young man of 32, is a graduate of a Turkish engineering school. Quick to assimilate the many details of highway maintenance work here, Ozgen foresees in Turkey's new oil wells the source of about all the asphalt they will need for a long time. The macadam roads are now to be improved with asphalt and cement, both of which commodities are made in that country.

Ozgen planned to return to his homeland September 15. "I'd better get back to my country, my wife and three children before I stay away so long they wonder who the strange man is, walking up to the house!" he said jokingly.

Ozgen had high praise for the Missouri Highway Department, and declared that he felt certain much of the Missouri program could be used to excellent advantage in his own country.

SNOW REMOVAL and ICE CONTROL

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◀ The BURCH "TILT-LEV" under-truck blade offers an all purpose maintainer especially suitable for ice removal. The high degree of operator control (all hydraulic) makes it excellent for general road and ditch maintenance. Fits any standard, heavy-duty truck.

◀ Illustrated is one of the many plow and wing combinations which are designed to hitch onto all trucks and tractors. The "SNO-FLO" moldboard design provides for speedy, efficient snow removal. It's the result of years of experience in building ROSS plows.

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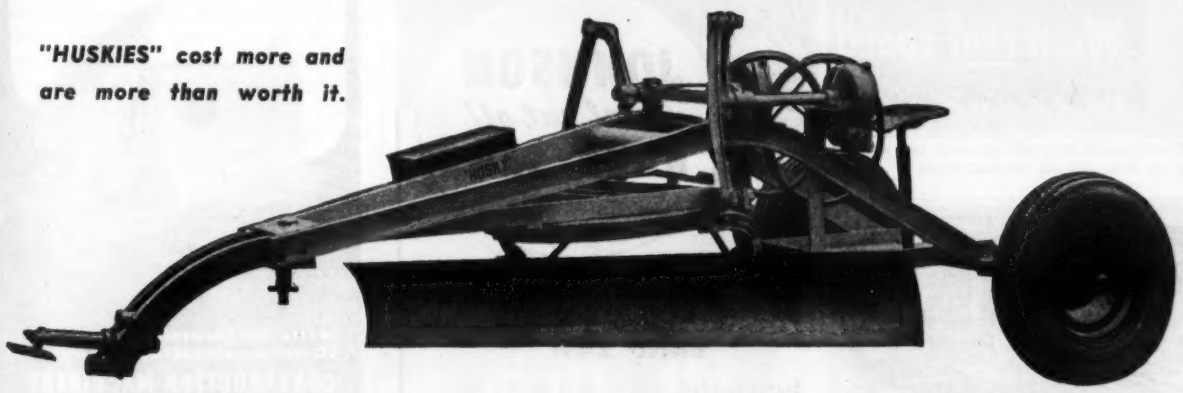

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The Model No. 33 HUSKY when pulled with a 40 h.p. wheel type tractor will complete more than a mile of new normal terracing per day. The No. 22 Model will complete nearly as much if soil conditions are favorable and if additional weight is added.

Both models are outstanding for highway maintenance and the No. 33 will rebuild a mile of normal Town road per day, ditches cleaned, sod cut and buried and the road complete ready for graveling.

HUSKIES are so strong that all parts, except tires, are guaranteed against breakage for one year regardless of why they break.

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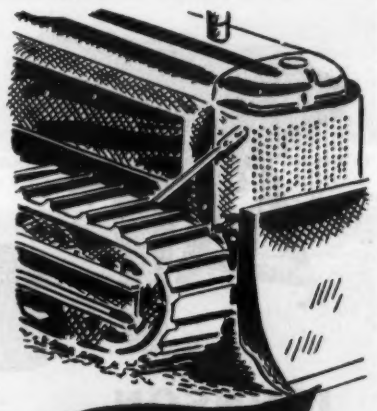

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Highway Exposition Held in Boston, Mass.

Mass. Highway Assn. Sponsors 3-Day Equipment Exhibition and Panel Discussions on Highway Problems; Attendance Good

✦ SOME 20,000 visitors poured into Boston's Commonwealth Armory and Parade Grounds to take part in the third annual New England Highway Exposition sponsored by the Massachusetts Highway Association. This, the largest and most elaborate of the shows presented in New England, was attended by state, county, and city highway and street officials; materials and equipment dealers; contractors; engineers; and the general public. This year's exposition, the purpose of which was the promotion of more and better highways, streets, and roads throughout the six New England states, featured not only all kinds of equipment used in road construction and maintenance but also preview demonstrations of new equipment, and a series of seven panel discussions along the lines of old-fashioned "bull-sessions".

Visitors and exhibitors alike agreed that this was the best show yet, with keen interest shown in equipment and in the informative discussions. Music, entertainment, and the many colorful exhibits were designed not only to attract the attention of prospective buyers of highway equipment and road materials, but also the public, who pays the bill for highways.

The educational conferences, held both mornings and afternoons, were led by panels composed of experts for each topic discussed. The subjects of these conferences included: highway improvement and roadside development, snow-removal and ice-control work, construction of concrete and bituminous pavements, development and use of equipment for grading and compaction operations, and integrated highway safety.

Over 700 of the visitors took time out from the exposition to convene downtown in the main ballroom of the Copley Plaza for dinner and talks. The principal point of the short after-dinner speeches was the dependence of New England's vacation and recreational trade on first-class highways and an integrated system of public roads. Edwin C. Johnson, President of the Boston Chamber of Commerce, pointed out that 85 per cent of New England's tourists come by automobile and that during the 1949 season there was the largest influx of autos in history. "These tourists", he declared, "bring in nearly $800,000,000 in business annually."

Equipment Exhibits

Among the numerous exhibits presented were the very latest in equipment models. Included was every kind of road machinery from small hand tools to the largest types of earth excavators, cranes, and rollers. The 18-cubic-yard twin-engine Euclid scraper and the 21-ton Buffalo-Springfield roller were the "goliaths" of the show. A new Ware trenching machine was previewed and put through its paces daily. A roadside seeding machine developed by the Connecticut State Highway Department seeded and fertilized one of the side slopes outside the Armory for the benefit of a score of onlookers. Other equipment included loaders, graders, shovels, snow plows, compressors, power units, hoists, drills, trucks, trailers, tractors, spreaders, sweepers, and other machinery and accessories for the highway industry.

Panel Discussions

The morning and afternoon discussions provided an opportunity for an interchange of ideas among highway officials, public and private engineers, contractors, equipment and materials dealers, manufacturers' representatives, and leaders of civic organizations. The topics for these conferences were purposely kept broad and were developed along strictly practical lines in order to be most useful and worthwhile. The discussions were actively and often vigorously participated in by members of the audience.

Roadside Development

The first of the discussions was on highway improvement and roadside development, with John V. McManmon, Landscape Engineer, Massachusetts Department of Public Works, as Moderator, and John L. Wright, Director of Roadside Development, Connecticut State Highway Department, as Discussion Leader. Cooperation between state officials and the groups interested in roadside development, it was said, can best be achieved with a rational view-

(Continued on next page)

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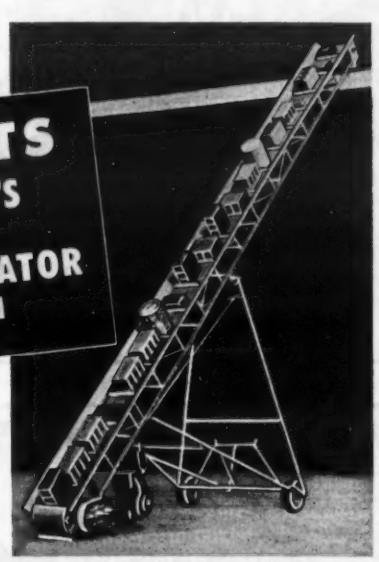

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★ Clutch and Brake Assembly *own* design (Extra)

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Also Available: 16' Elevator (Same Design)

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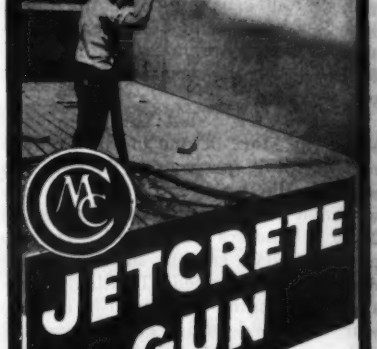

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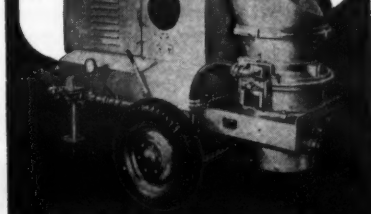

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JOHNSON Model J BAND SAW

Sturdy and fast, with the extra rigidity that permits higher speed operation without shortening blade life, and the extra accuracy that cuts square and true, saving machining time. Extra capacity too—10" rounds, 18" flats. It's everything you want in a band saw.

JOHNSON Model B BAND SAW

A smaller, lighter, portable version of the Model J, with the same three-point-supported rigidity, and all the weight required for its capacity. All the accuracy and speed of the larger model. If you have metal cut-off work up to 5" rounds, 10" flats, this is the ideal tool for it.

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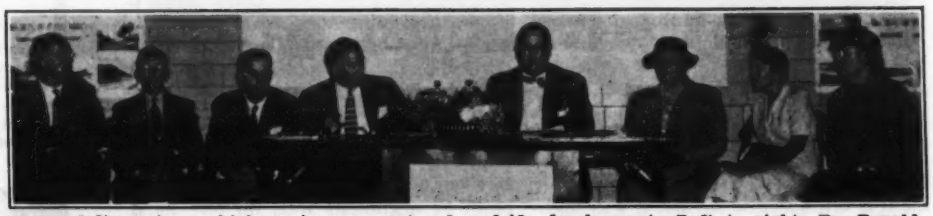
Some 20,000 visitors flocked to Boston's Commonwealth Armory and Parade Grounds for the third annual New England Highway Exposition. One of the show's attractions was this Euclid, largest scraper in the world.

Near the Euclid was this exhibit of Barber-Greene loaders.

"What's new in grading and compaction?" Left to right: Edward R. Galvin, Engineer, Massillon, Ohio; Earl Bennett, Manager of Road Materials Sales, Koppers Co., Moderator; Austin E. Page, Chief Engineer, Lane Construction Co., Discussion Leader; Philip Keene, Connecticut Engineer of Soil Mechanics; and George H. Delano, General Chairman of the Exposition, and Project Engineer for the Massachusetts Department of Public Works.

Integrated highway safety is the topic here. Left to right: Edgar F. Copell, President of Massachusetts Safety Council, Moderator; Frederick J. Graf, Chief Engineer, Massachusetts Bonding & Insurance Co., Discussion Leader; Dwight Myers, Providence, R. I., Traffic Engineer; Fred W. Hauck, Rhode Island Designing Engineer; Curtis J. Hooper, Connecticut Director of Highway Planning; and Guy M. Jones, Safety Engineer, Lumberman's Mutual Insurance Co.



A panel discussion on highway improvement and roadside development. Left to right: Dr. Donald Wyman, Arnold Arboretum, Harvard University; Ray M. Koon, Director, Waltham Field Station, University of Mass.; George Gordon, Assistant Landscape Engineer, Bureau of Public Roads; John L. Wright, Connecticut Director of Roadside Development, Discussion Leader; John V. McManmon, Massachusetts' Landscape Engineer, Moderator; Mrs. David D. Barnes, Blue Star Memorial Highway Committee; Miss Miriam Townsend and Mrs. Walter W. Gaskill, Garden Club Federation of Massachusetts.

point towards the economy of the projects. Conservation of existing topsoil, vegetation, and natural sites is a principal means of effecting this economy.

A proper analysis of the terrain before construction begins will, it was said, indicate which features may be retained and permit conservation of natural attributes. A soil analysis will disclose the best use of the topsoil and the vegetation that may be most easily cultivated for adequate erosion control. Horticulturalists agreed that native plant life will often overrun seeded exotic plant and grass growths and therefore is often better used in the initial design. With this and maintenance economy in mind, it was suggested that the hardier of the native plants be used, to limit the amount of pruning, spraying, and care necessary. However, the discriminating use of exotic plants, along with inexpensive native plant material, can add

(*Continued on next page*)

Among the hundreds of other units on display outside the Armory were an American No. 8 grader with front-end loader, a Quick-Way Model J with trench hoe, a Thew-Lorain shovel, and an Adams road grader.

C. & E. M. Photos

Inside the Armory, the camera picks out a new Roadsaver material spreader shown for the first time at the Exposition, and a Wayne street sweeper, at right.

From the other end of the hall, some of the snow and ice-control units on display. Flags, bunting, and a continuous entertainment program gave color to the show.

Highway Exposition Held in Boston, Mass.

(*Continued from preceding page*)

to the appearance of the roadsides.

State officials pointed out that turf areas must be limited to home fronts, center strips, and other absolutely necessary spots to reduce mowing operations. Other economy measures suggested were limiting the purchase of topsoil and foresight in planning wayside areas to avoid the excessive cost incurred when these sites are purchased after the road is built.

Grading and Compaction

The discussion on compaction and grading centered around the proper selection of equipment. Earl Bennett, Manager of Road Materials Sales, Koppers Co., was Moderator and Austin E. Page, Chief Engineer of Lane Construction Co., was Discussion Leader. The question of the use of modern heavy equipment for highway grading operations finally resolved in agreement that all units are useful, but that discretion is needed in selecting the right piece for the right job. Operating limits were agreed to be approximately 75 to 100 feet for dozing work, up to 1,000 or 1,200 feet for crawler-type tractor-scraper teams, and that earth-hauling distances over this are best handled by rubber-tired tractor-scraper units or by power shovels with dump trucks and wagons.

These figures vary somewhat, of course, and often depend upon the availability of equipment. Working close to fixed structures with heavy equipment is often a false saving, it was said. It was noted that the front-end loader is coming into very wide use for odd jobs.

Everyone reported increased cooperation between engineers and contractors to eliminate much of the "sandpapering" on side-slope work. The replacement of hand labor by machines results in considerable saving. In line with this, all concerned favored a change in specifications to design a 3 to 1 slope which would permit machine-finishing operations. One of the officials pointed out that in addition to the saving, this would prevent peeling of the upper hand-finished surface from the machined under surface. The slope reduction will, of course, reduce soil stabilization problems. Along with this, some specifications are also allowing a 6-inch control with no pronounced undulation.

Compaction problems center around resolving modern engineering specifications based on laboratory testing with the old "suitable compaction" specifications. The best answer seems to be to combine modern testing and control methods with observation by experienced soil engineers in the field. As far as equipment is concerned, vibratory units are limited to cohesionless soil and find excellent use for backfilling around structures, while the sheepsfoot roller is best for clayey soils and the pneumatic-tire units for gravelly soils, it was said.

Highway Safety

The conference on integrated highway safety was moderated by Edgar F. Copell, President of the Massachusetts Safety Council. Frederick J. Graf, Chief Engineer, Massachusetts Bonding & Insurance Co., was the Discussion Leader. The main question introduced to the group was: Why spend vast amounts of money for long sight distances, superelevations, and added design control for a 50-mph road when, after a few years, fringe development makes it necessary for local law enforcement agencies to zone the road at 25 mph because of congestion due to roadside businesses. The answer given was, don't. That is, if you are going to keep a high-speed road it must be a controlled and limited-access road. The added safety is an additional reward of this type of highway.

The discussion of limited-access roads naturally brought up the question of free versus toll roads of this type. The point of argument was, on one hand, the great saving in costs of collection and in added interest on borrowed money against the commonly held thought that out-of-state travellers pay for the toll road. These questions remain for individual state governments to solve.

Snow and Ice Problems

The discussion on snow-removal and ice-control operations revolved principally around the use of salt, or sodium chloride as some highway groups choose to call it. It seems that the latter terminology reduces public complaints that the ice-control mixture being used is interfering with the operation of their car engines. Some highway officials also pointed out that it is better to stress its use as being safer than sand rather than cheaper, though savings of $100 per mile have been reported. The deleterious effect of salt on concrete roads is still a moot question. All agree, however, that traffic is important for its successful use.

Concrete Paving

One of the most interesting facts brought to light in the conference on concrete highways was the use of two-way radio-telephones on truck-mixers. The drivers use these phones to report in when they hit the job and when they leave. These times are recorded by the dispatcher at the central plant. This prevents "coffee-time" from being taken

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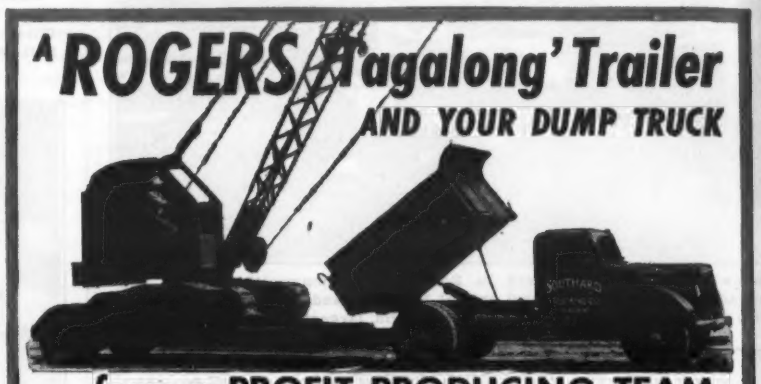
A ROGERS 'Tagalong' Trailer AND YOUR DUMP TRUCK



...form a PROFIT-PRODUCING TEAM

Contractors everywhere are turning to the Rogers "Tagalong" for a bigger day's work with maximum economy.

One man can do all jobs. Load and unload trailer, connect and disconnect it; drive truck and operate equipment carried.

Ideal for light and medium shovels, cranes, bulldozers, etc.

Write for complete information.

Showing cable around sheave and dump body about to be raised to engage towing tongue.

Body elevated. Tightened cable has raised drawbar and engaged towing tongue. Safety coupling pin is inserted. Trailer is ready to roll when body is lowered.

ROGERS HEAVY DUTY Gooseneck Trailers

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DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS SINCE 1915

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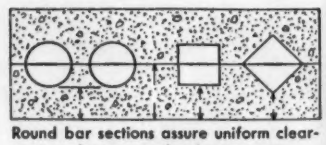
The Seventh of a Series in the interest of more efficient use of steel . . . a vital American resource

For the BEST ANCHORAGE don't put "square pegs" in "round holes"

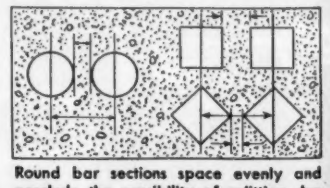
Square reinforcing bar corners break the normal annular gripping of steel by the concrete.

USE LACLEDE MULTI-RIB REINFORCING BARS . . .

The advanced design of Laclede Multi-Rib Bars rolled to A.S.T.M. A 305-47T specification with round bar sections in all sizes assures improved anchorage with uniform concrete cover. Multi-Rib Bars have a high safety factor by combining anchorage ability well in excess of the A.C.I. recommendation of .10 fc with 65,000 p.s.i. yield point steel.



Round bar sections assure uniform clearance and coverage by the concrete.



Round bar sections space evenly and preclude the possibility of splitting due to poor coverage.

Write us about specifying LACLEDE MULTI-RIB BARS on your jobs.

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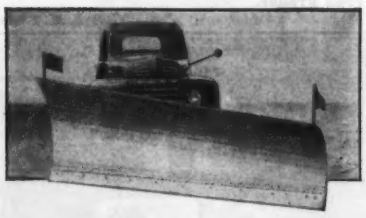
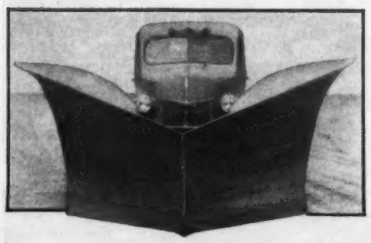
SNOW REMOVAL with GLEDHILL plows



The well known, efficient one way plow. Fits all trucks • Easily attached • Fold back hoist • Automatic blade trip • Sturdy, all-welded construction.



Gledhill's V-Plow — Wide wing span • Heavy duty construction • Interchangeable • Direct lift • Reasonably priced.

Write for complete specifications!

THE GLEDHILL ROAD MACHINERY CO.

GALION, OHIO

—especially on the outgoing trip. It also makes it easy for the engineer on the job to step over to the cab and report any dissatisfaction with the mix to the plant control man. This facilitates closer and speedier control of variations in the plant.

One problem seemed to be rather universal and eventually was discussed at each of the meetings: Are highway specifications to designate the requirements of the finished product or are they to designate the manner in which the operations are to be performed in order to produce the specified result, or both? The supplier-contractor desire is a minimum of direction in operation. He contends that if the finished job meets the specifications, what difference does it make how he does it. The purchaser-engineer desires the best finished product with a minimum cost; he states that often the best way to obtain this is to include operating procedures in the specifications. It appears that even though one or both designations can be used for the general case, controversy will very likely continue to arise on individual jobs.

Mass. Highway Assn.

The Massachusetts Highway Association, sponsor of the Exposition, is the oldest organization of its kind in America. It was formed in 1893 to further promotion and development of good roads. Since that time it has carried on a program to acquire and disseminate knowledge of value, both in theory and in practice, to the construction and maintenance of streets and highways. Its membership is composed of leading highway officials of the State and distributors of materials and equipment for the road-construction industry.

The Husky all-purpose grader is now hydraulically equipped so that it can be controlled from the front and the rear.

All-Around Grader, Hydraulic Controls

The Husky all-purpose road grader, maintainer, ditcher, and terracer is now hydraulically equipped so that it can be controlled from the front and from the rear. This grader is manufactured by the Northfield Iron Co., Northfield, Minn.

The hydraulic power can be taken from the tractor's hydraulic pump, or the grader can be equipped with a small gasoline engine and oil pump to operate the hydraulic controls. The latter allow the grader to be attached to the tractor with a drawbar as the sole connection.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 17.

Applied Engineering Data

With the publication of its "Application Engineering Data on the Parshall Flume and Weir Flow Recording Controller", The Foxboro Co., Foxboro, Mass., begins a series of service publications for contractors, engineers, and public-utility men.

As indicated by their name, the sets of Application Engineering Data are intended as practical tools for use in planning, estimating, and preparing specifications. The data set mentioned contains dimensional diagrams for different types of flumes and weirs, tables of flow values, specifications for standard instruments for flow measurement or control, and suggested wording of an acceptable procurement form for soliciting contractors' bids. Sets of data sheets on other subjects in the field of public-works engineering will follow.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 57.

Eastern Sales Division Changes for Houghton & Co.

Several changes have been announced for the Eastern Sales Division of E. F. Houghton & Co., manufacturer of industrial oils, chemicals, and leathers.

The division itself has been divided into two sections: Eastern Sales North, which will include New England and New York State, and Eastern Sales South, which will include Pennsylvania, New Jersey, and Delaware. Orum R. Kerst will head the north section and J. R. Clendenning the south.

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GATKE Custom-Bilt BRAKE BLOCKS

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Have smooth, powerful action and operate quietly.

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YOU, TOO, can move big loads faster, easier, at less cost with LaCrosse *spring-mounted* trailers. 19 to 33-ton capacity . . . flat, drop or low drop designs. Also standard low beds from 8 to 67-ton cap.

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☐ Rush complete facts on new 19 to 33-ton spring-mounted trailer.

☐ I may be interested in this type trailer about..... (date)

for hauling ..... (type of equipment)

Name..... Title.....

Employed by.....

Address.....

City..... State.....

LaCROSSE
Low-Cost TRAILER TRANSPORTATION

In-Service Training Launched in New York

(*Continued from page 1*)

in Albany, the architectural force attended a session devoted to their particular problems. The same course was run a day later in New York City for architectural personnel in that office.

The fifth session was conducted for engineering personnel in the district offices only. The subjects covered were presented specifically for field engineers and were: bridges, landscaping and roadside development, and structural-design problems.

Again, special sessions for architects were conducted in the Albany and New York offices on the day following the presentation for field engineers in District 1.

Beyond the first session. which was general and appropriate for all employees, the program content was selective in nature, arranged so that each subject was presented by a top-ranking authority in the field and was delivered only to those employees having interest in it.

In addition to the general five-session program for technical and clerical personnel, an extension program was conducted at the district level. These secondary sessions were conducted by the district engineers for maintenance personnel in their jurisdictions and for county assistant engineers. The program content here also was selective and specific, with the result that the individual was given pertinent and valuable information but was not annoyed by forced exposure to speeches or demonstrations in which he had little interest.

If the necessary editorial personnel can be mustered for the task, it is proposed to make a condensation of the entire in-service training program material presented during this season. This would appear in the form of a small booklet for distribution to every employee of the Department and county personnel having interest in it. It is hoped that this may be accomplished during the summer so it may be available for individual perusal before the next year's program is launched during the coming winter. It is obviously desirable to conduct these programs during the winter months when most of the district-office personnel are occupied in or near their headquarters.

Future Programs Planned

Tentative plans for next year's in-service training program are being formulated in recognition of omissions of material in the first program, and also with the intent to go into more specific detail and still greater specialization. An analysis made of the first program indicates that much valuable information was gained from it. Experience gained from it will be applied to improve the techniques of presentation in future efforts.

One of the most valuable observations made is that the avid interest in their work which employees displayed generally makes them unresponsive to redundant, time-consuming wordage or subject matter. Characteristically, they are highly receptive to solid, specific instruction that will help them do their work with deeper understanding and greater efficiency.

Hand-Guided No-Gap Welding Electrode

A new electrode, Eutec-Hand-Omatic, is announced by Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y. It is an ac/dc no-gap electrode which, the company claims, is merely pressed against the metal and drawn straight along, like a pencil, without a weaving motion. The weld results automatically, and since no arc gap is maintained, operation is easy. Constant watchfulness to prevent burning through light-gage steels is reduced with Eutec-Hand-Omatic, since the risk of burning through is negligible, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 7.

Explosives Handbook

A new 40-page explosives handbook has just been released by the Illinois Powder Mfg. Co., Dept. JM, 730 Pierce Bldg., St. Louis 2, Mo. Pocket-sized, the catalog presents detailed information on the characteristics of various types of explosives, together with a table recommending explosives for use under average conditions. A reference guide helps in determining the quantities of explosives required in specific applications.

This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 80.

Concrete Admixtures

An information sheet on the Anti-Hydro line of admixtures for concrete is available from the Anti-Hydro Waterproofing Co., 265-277 Badger Ave., Newark 8, N. J. A general description, specifications, test results, and quantities to be used for the purpose of estimating are given for Anti-Hydro integral waterproofing and hardening compound.

This circular also provides a brief description of other waterproofing, hardening, dampproofing, anti-freeze, and elastic caulking compounds manufactured by the company. Complete data and specifications on any particular product may be had on request.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 151.

SPEED OPERATION for Snow Plows and Road Machinery with the . . . .

MONARCH New and Improved HY-LO-JACK

Fan Belt Driven

Power Hydraulic Control

Lifts plows ten times faster than hand pump. Cab-controlled. Easy installation on new or existing equipment. Priced for the most conservative budget.

WRITE FOR CIRCULAR H-75

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BUCKETS
Stronger because they're constructed of welded rolled steel . . . lighter because non-essential weight has been eliminated. Wellman buckets meet every requirement of heavy service with longer life and lower cost! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service. 3/8 to 16½ yd. capacity.
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Hinged uprights fold over to reduce the overall height of the improved Model T4 Traxcavator to 7 feet 11 inches.

Tractor Excavator

The improved Model T4 Traxcavator made by the Trackson Co., 3333 S. Chase Ave., Milwaukee 1, Wis., brings a multi-purpose unit to the excavating, dirt-moving, and material-handling field. The new T4 is regularly equipped with a 1-cubic-yard bucket which is standard for digging, excavating, grading, loading, etc. It also offers other special buckets for other types of work, and a bulldozer blade 79 inches long and 34 inches high, with a reversible cutting edge.

The Traxcavator has a wide digging range: from 14 inches below the track line to 56 inches above. Its special lifting-arm motion tilts the bucket back 30 degrees during the first part of the lift to minimize spillage. The bucket may be dumped at any point of the lift. The Traxcavator is powered by a Caterpillar D4 tractor equipped with wide-gage extra-long non-oscillating track frames.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 108.

Line of Electric Tools

Catalogs on electric hand and bench tools have been prepared by the Speedway Mfg. Co., 1834 S. 52nd Ave., Cicero, Ill. They cover the company's line of saws, drills, grinders, and buffers. Fully illustrated, the folders point out all features of the tools and list their specifications, accessories, and prices.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 47.

Self-Priming Pumps For Electric Drive

Self-priming Rex pumps are now being built for electric-motor drives, with two new mountings, announces the Chain Belt Co., 1666 W. Bruce St., Milwaukee 4, Wis. They are made in a 2-inch and a 3-inch model. Features claimed for these new pumps and mountings are: ability to take any speed of a motor of the proper horsepower, compactness, rotary grease seal, and a press-formed steel body and volute.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 132.

Plexiglas Saw Guard

A new transparent guard for circular saws of 8 to 20-inch diameter keeps the blade covered at all times, yet allows the operator full view of saw and work. Made of acrylic plastic Plexiglas, a product of Rohm & Haas Co., the guard

This transparent guard for circular saws keeps the blade covered at all times yet allows full view of the work.

is manufactured by the Laminated Sheet Products Corp., 259 A St., Boston 10, Mass. It comes in two styles—Type A for stock not more than 3 inches thick, and double-pivoted Type B for thicker stock.

A pin arrangement allows the guard to be held in a vertical position for adjustment or changing of blades, yet ready for instant lowering. Thus there is no possibility of the guard's being removed and not replaced. The lightweight shatter-resistant plastic and free-pivoting mounting make the guard self-adjusting to work of any height.

The guard is designed for spreader mounting, but is sold without a spreader because most users prefer to adapt the mounting to their own requirements. If a spreader is undesirable, mounting can be made from above or from the side.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

A Protective Preservative

A brochure on Farbertite, a coal-tar preservative compound, is available from the Briggs Bituminous Composition Co., 1347-53 E. Montgomery Ave., Philadelphia, Pa. Farbertite is applied cold and will adhere to wood, steel, concrete, and galvanized metal, the company says. Specifications, features, and instructions for application are included in the bulletin.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 83.

NEW! Heating Unit for Winter Jobs

- Ideal for Concrete Work
- Quickly Thaws Out Materials
- Over One Million B.T.U. Output

BEHLEN HEAT BLOWER

$407 FOB Columbus, Nebr.

A sturdy, dependable heating plant. Has many construction uses. Recommended for concrete work in low temperatures. Warms aggregate at batching plant; prevents freezing concrete while setting. Just the thing for drying and curing plaster or paint and other such jobs. Preheats machinery. Burns 1 to 9 gals. distillate or kerosene an hour; furnishes up to 1,100,000 B.T.U.'s direct heat per hour. Built-in fan delivers up to 7,000 CFM at ½ inch water pressure or 5,000 CFM at 5 inches pressure up to 250° F output. Gasoline or electric motor furnished if desired. Adjustable outlet pipe is removable for adapting to fit job. Mounted on skids. Used on Federal and private construction. Almost 3,000 in use on farms dehydrating corn. Beat cold weather delays . . . write, wire for full information . . .

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Windrow mixing in bituminous construction with the Seaman Trav-L-Plant. Equally efficient in flat-spread mix.
SPOTLIGHTING
THE NEW
SELF PROPELLED
SEAMAN
TRAV-L-PLANT
Seaman Trav-L-Plant mixing in bituminous construction.
Two Seaman Self-Propelled units mixing in soil-cement construction.
Seaman Self-Propelled (or Trav-L-Plant) mixes as it turns.

A new SEAMAN development: the TRAV-L-PLANT keeps the internationally accepted, Seaman Pulvi-Mixer principle of blending road materials with a mixing chamber, but now the SEAMAN PULVI-MIXER is —

- ★ completely self-propelled
- ★ equipped with spray bar, pump and tachometer for bitumen or water
- ★ equipped with selective forward speed transmission

Self-propelled for economy, versatility, maneuverability and easy transport . . . Pump, tachometer and spray bar for accurate placement of bitumen or water *immediately* ahead of the mixing rotor. No migration, No evaporation . . . Selective speed transmission to control rate of forward travel to get the most efficient mixing speed for every field condition.

Results: More square yards per day. Absolute, precision control of mixture. Ample power for every job. "Road-mix" operation, the lowest cost method. Less initial investment than other mixing equipment.

Naturally, your choice will be a SEAMAN TRAV-L-PLANT.*

*Also offered without spray bar, pump and tachometer as the SEAMAN Self-Propelled PULVI-MIXER.

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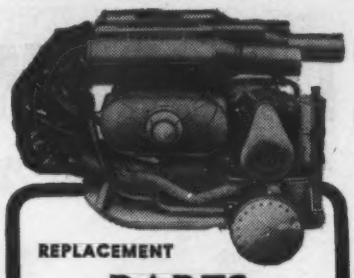

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